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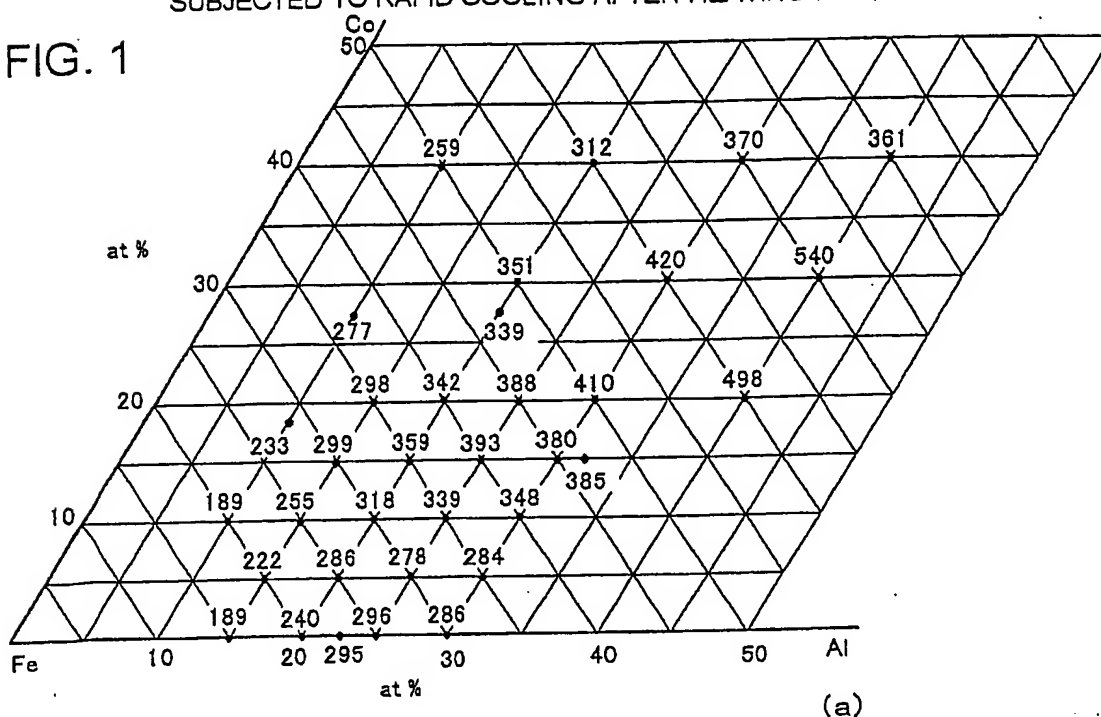
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HARDNESS DISTRIBUTION WHEN Fe-Al-Co TERNARY ALLOYS ARE
SUBJECTED TO RAPID COOLING AFTER HEATING AT 1,200 °C

FIG. 1



HARDNESS DISTRIBUTION WHEN 10-HOUR AGING IS DONE AT 600 °C

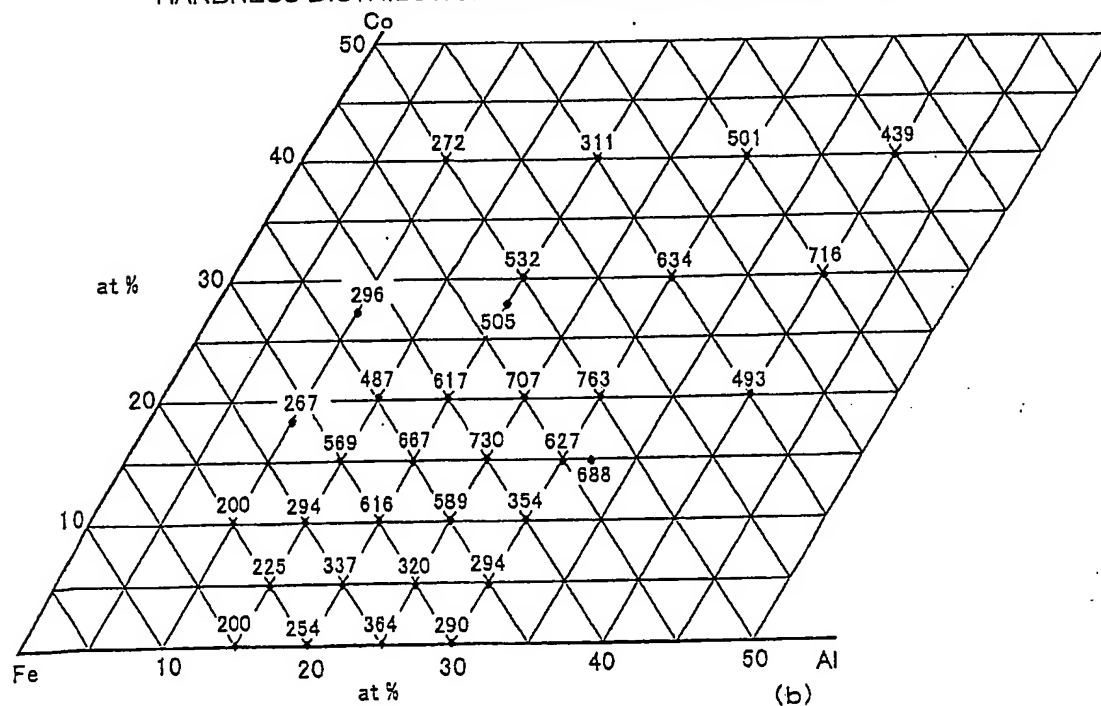


FIG. 2

EFFECT OF ADDITION OF Co UPON HARDNESS OF Fe-Al ALLOYS

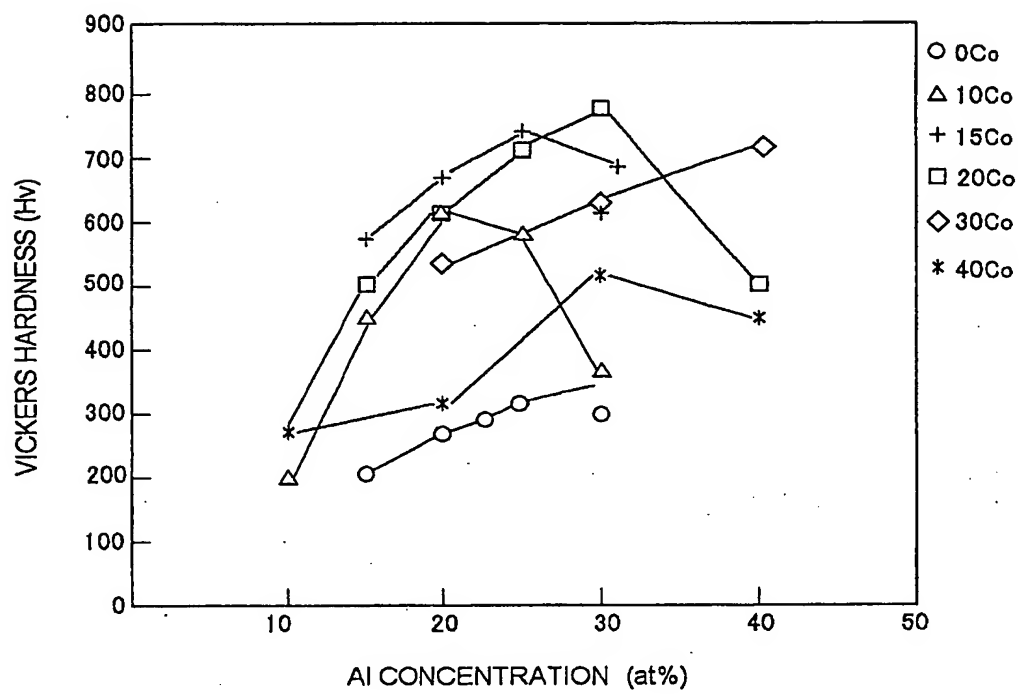


FIG. 3

CURIE TEMPERATURE OF Fe-Al-10AT% Co ALLOYS

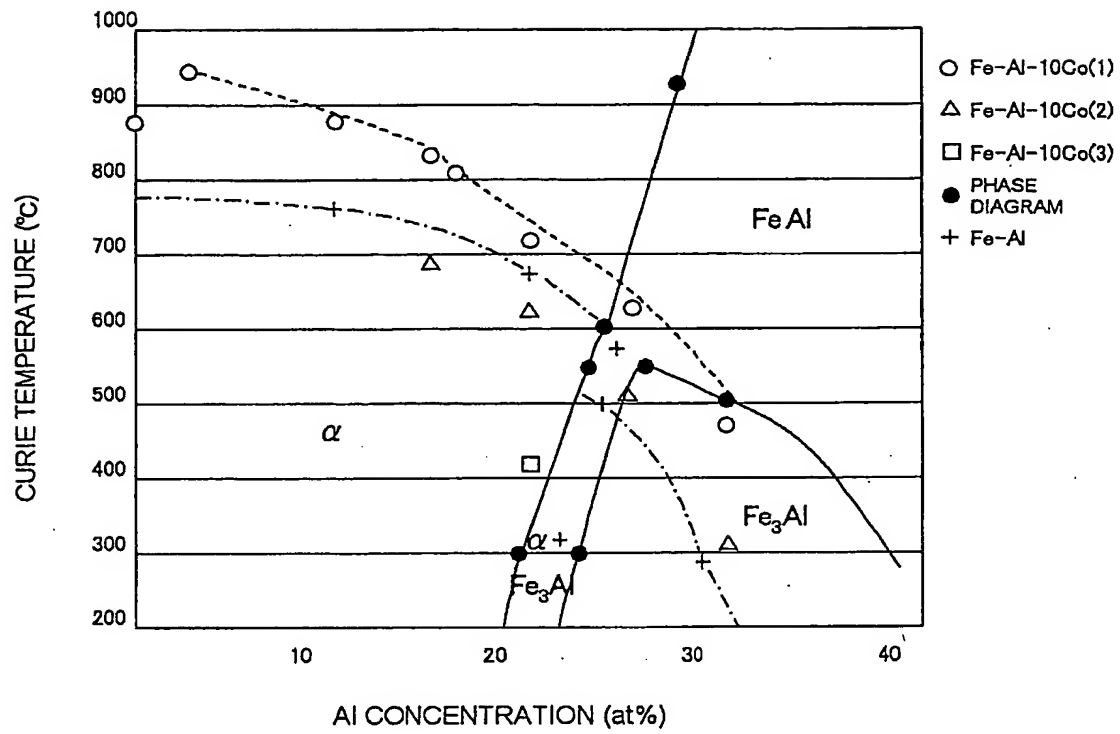
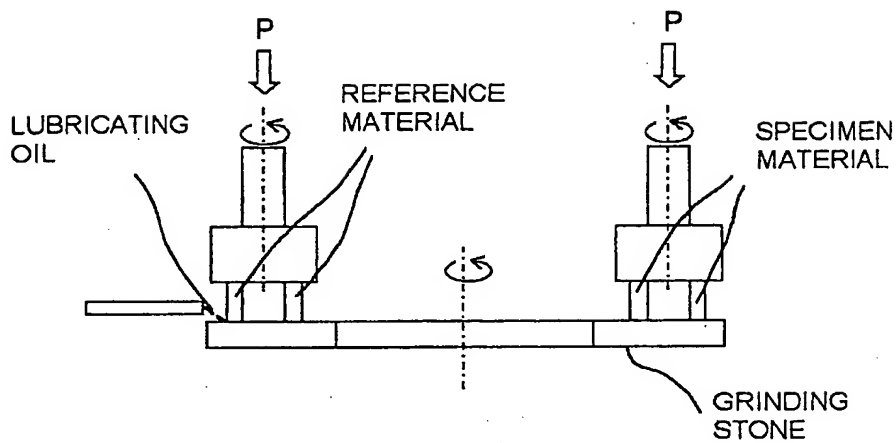


FIG. 4



LOAD: 100kg
ROTATIONAL SPEED OF GRINDING STONE: 60rpm
ROTATIONAL SPEED OF SPECIMEN: 10rpm
LUBRICATING OIL: #30 OIL
AMOUNT OF LUBRICATING OIL: 5cc/min
REFERENCE MATERIAL: S45C QUENCHED AND
TEMPERED MATERIAL
(Hv=500)

FIG. 5 HARDNESS OF Fe BASE ORDERED PHASE MATERIALS VERSUS THEIR ABRASION RATIOS

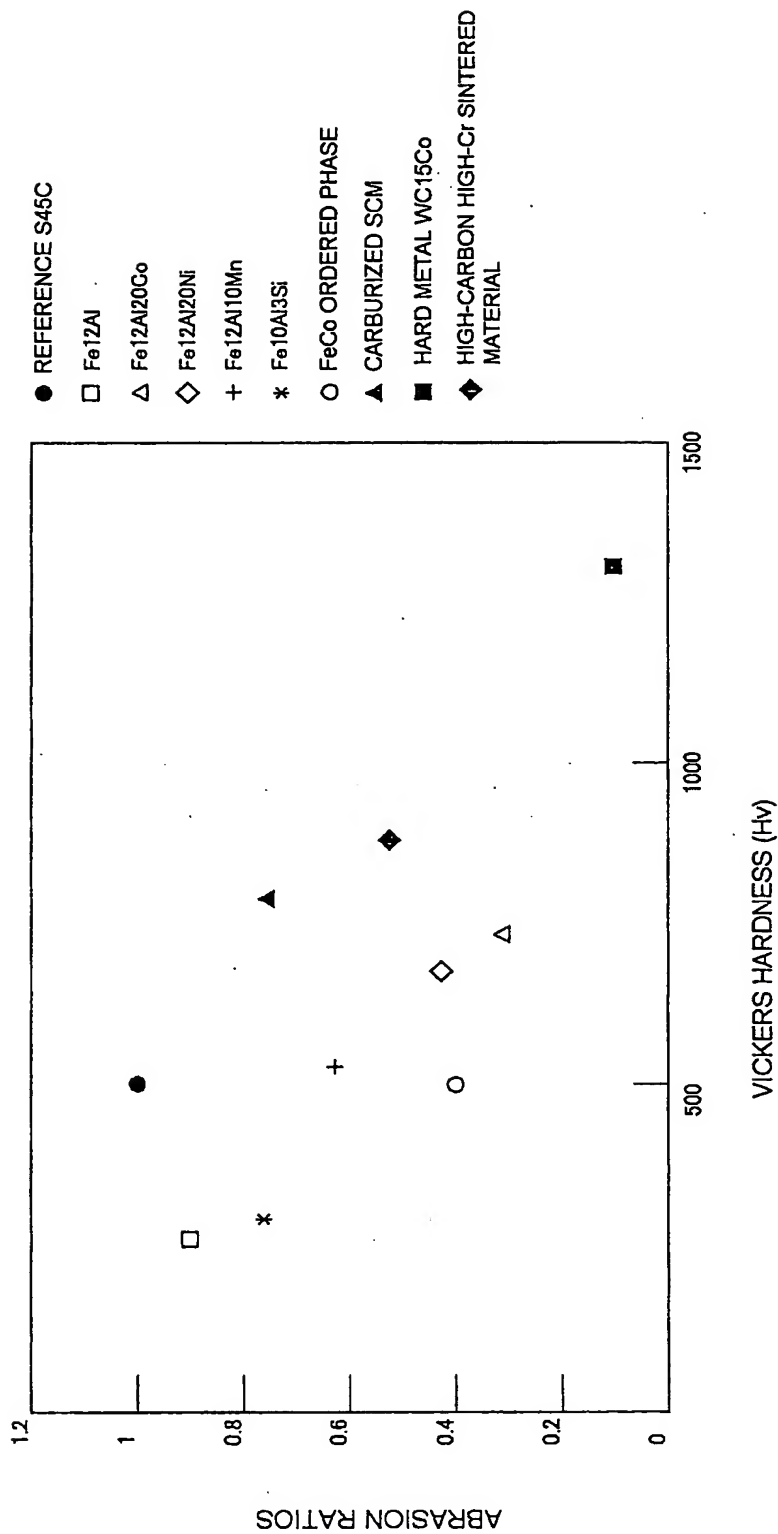


FIG. 6

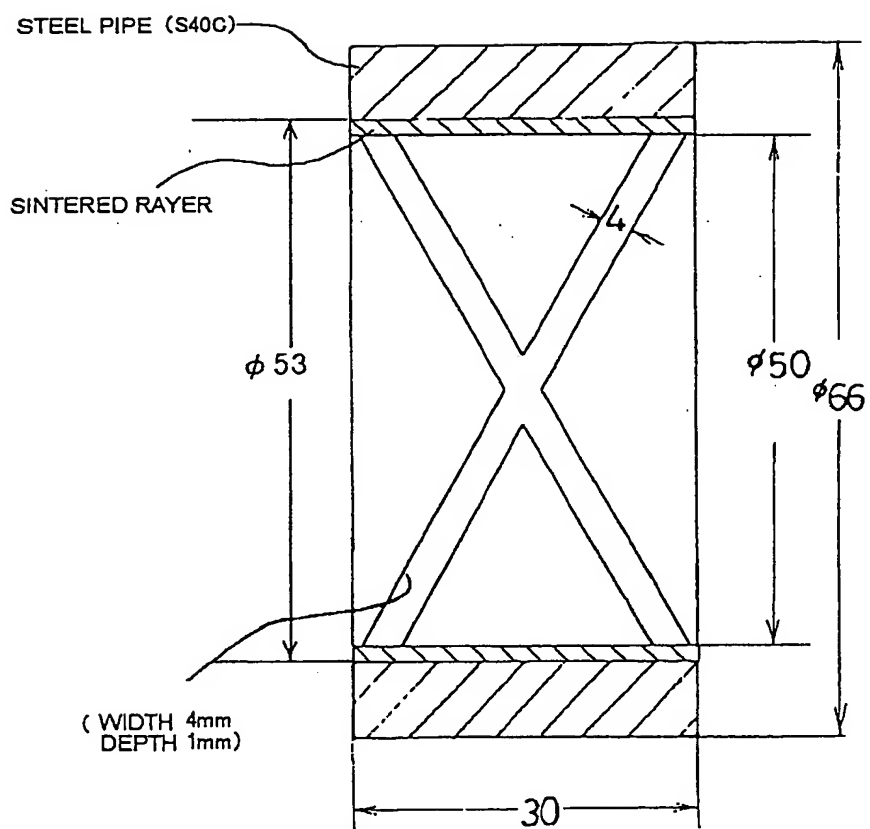


FIG. 7

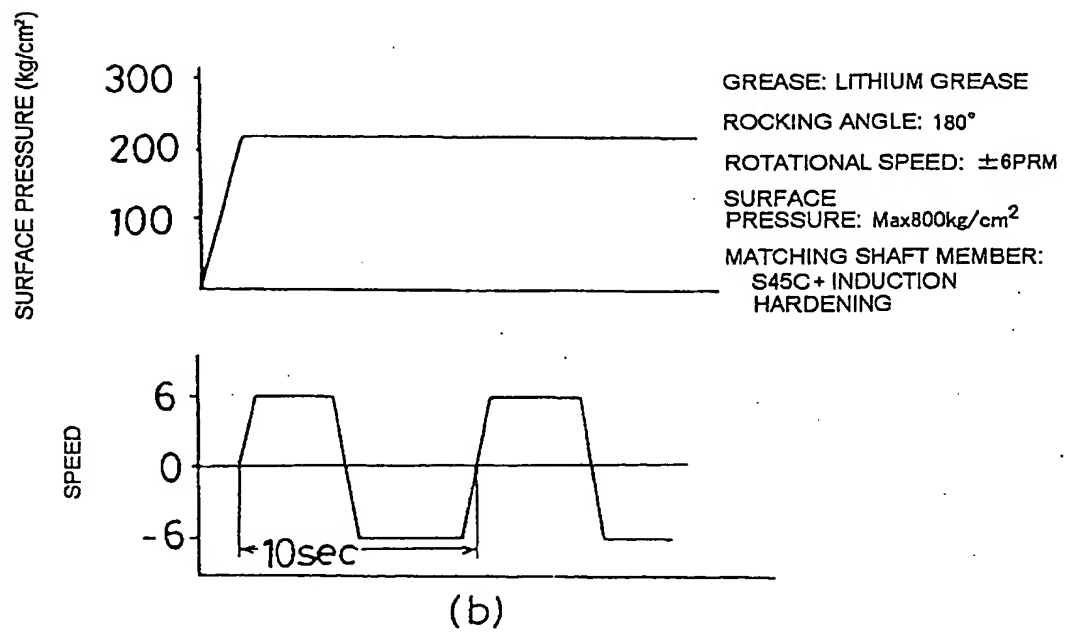
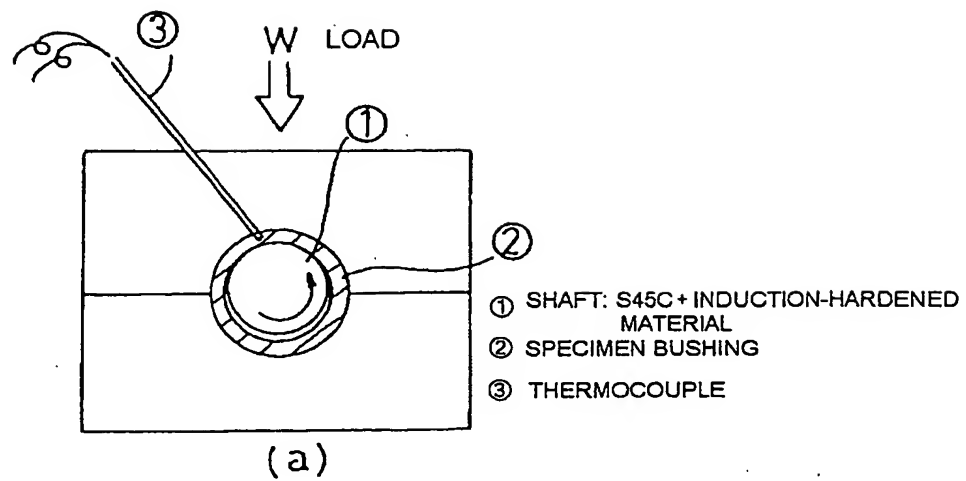


FIG. 8

COEFFICIENTS OF SLIDING CONTACT FRICTION
OF Fe BASE ORDERED PHASE MATERIALS

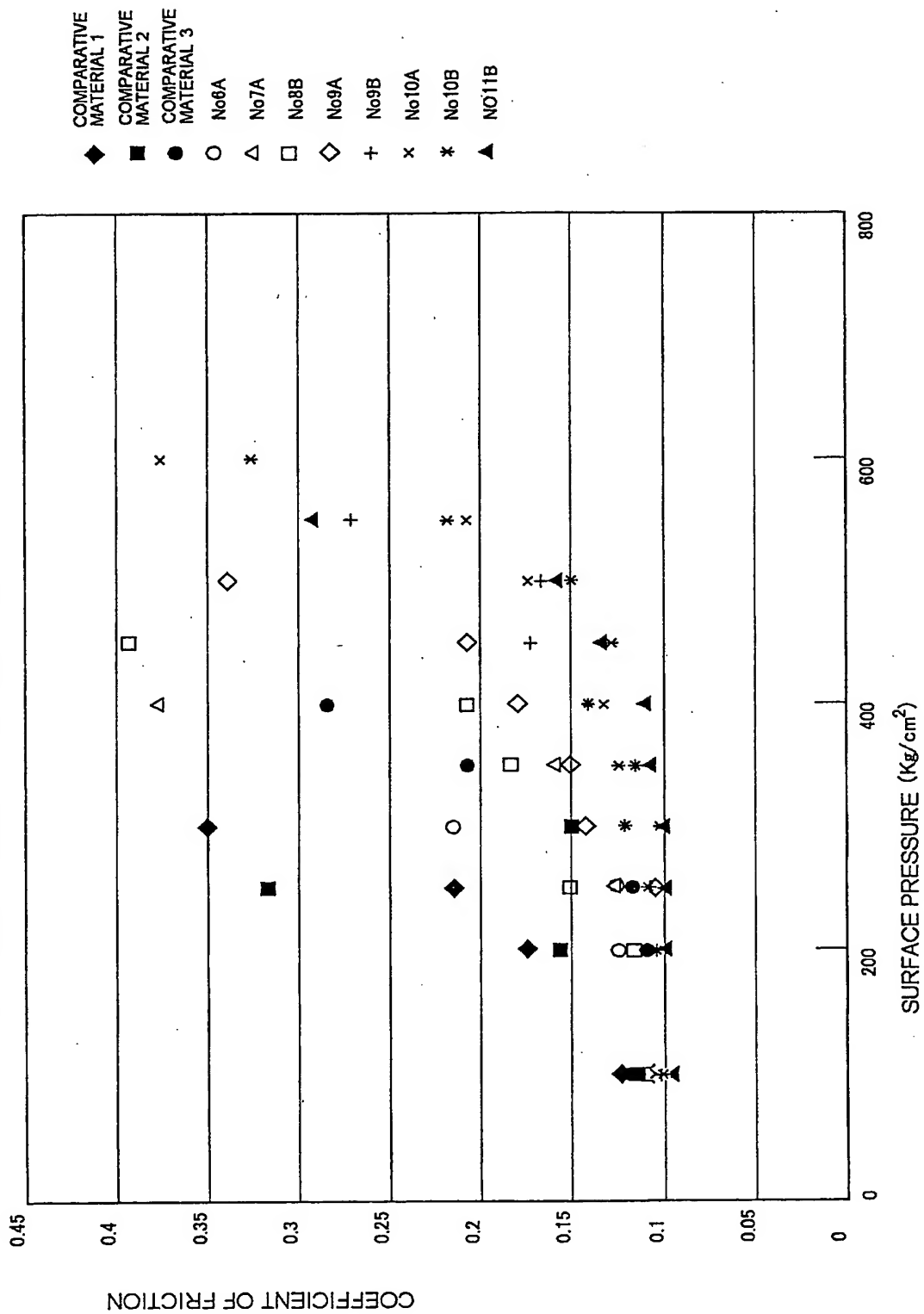


FIG. 9
SLIDING ABRASION AMOUNTS OF Fe BASE
ORDERED PHASE MATERIALS

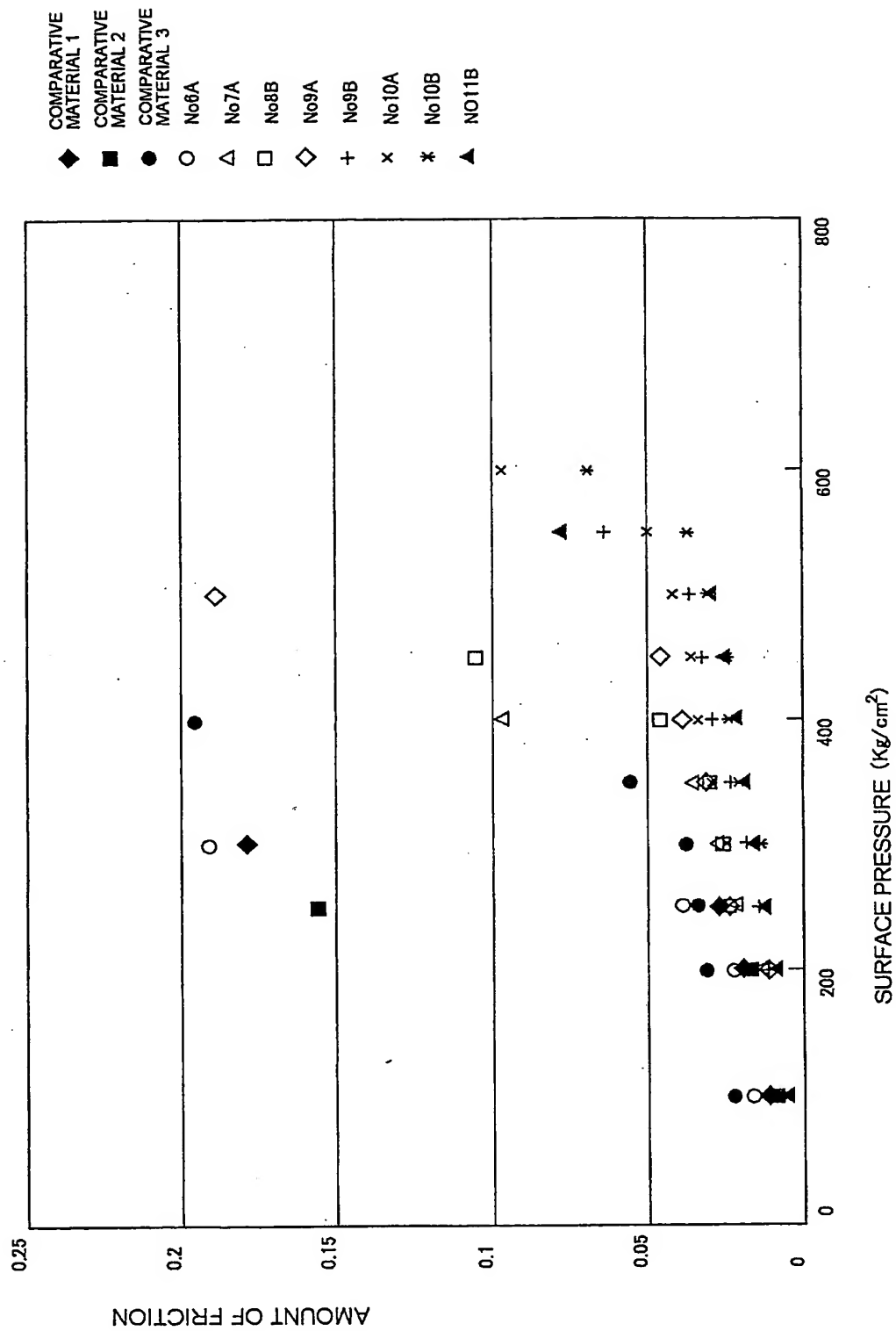


FIG. 10

(UNIT :mm)

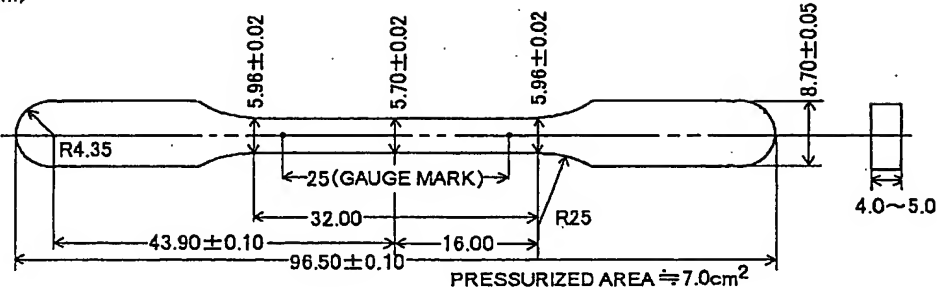


FIG. 11

SINTERING PROPERTIES OF FeAlCu BASE MATERIALS (1140°C)

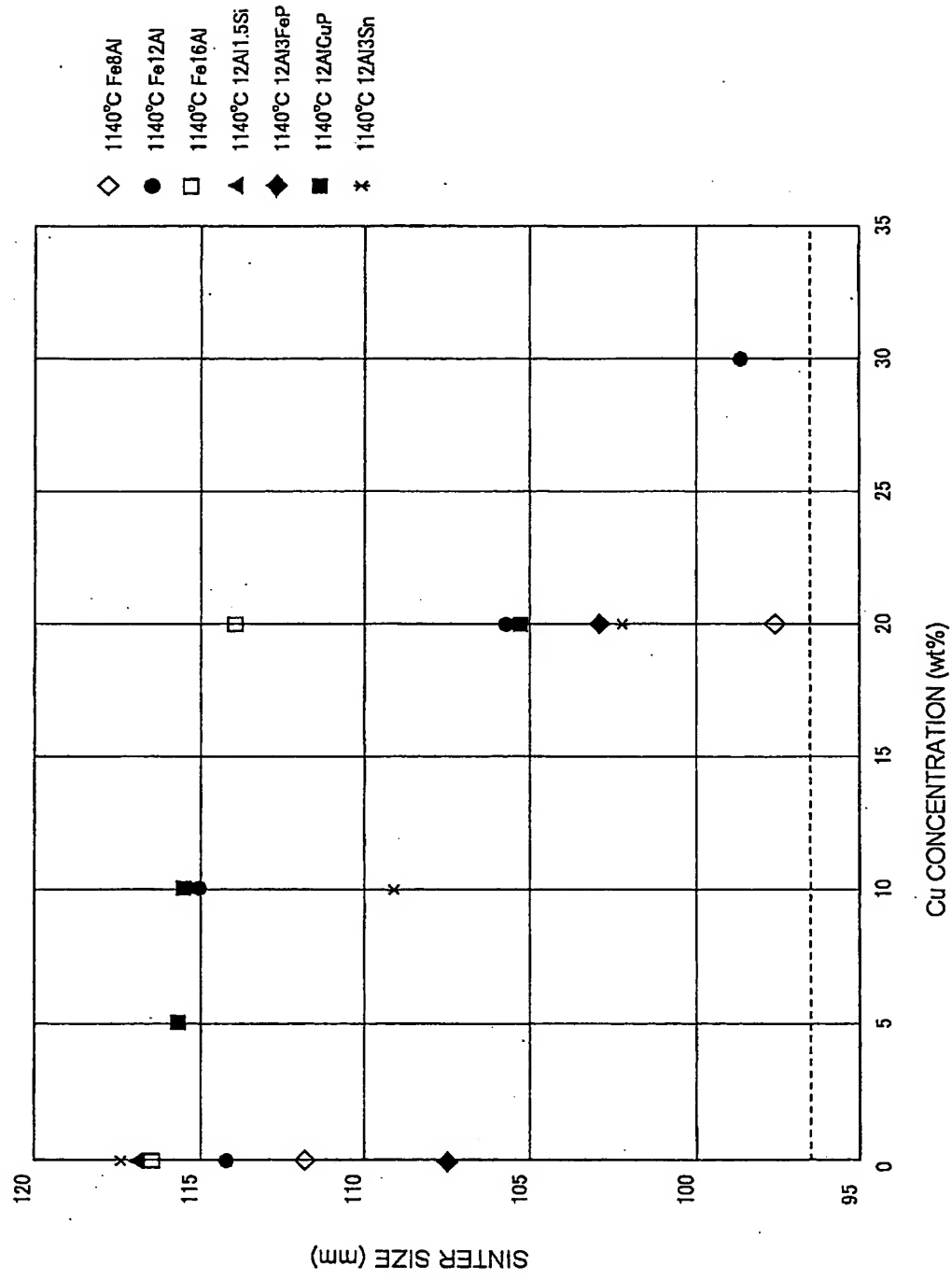


FIG. 12 SINTERING PROPERTIES OF FeAlCu BASE MATERIALS (1200°C)

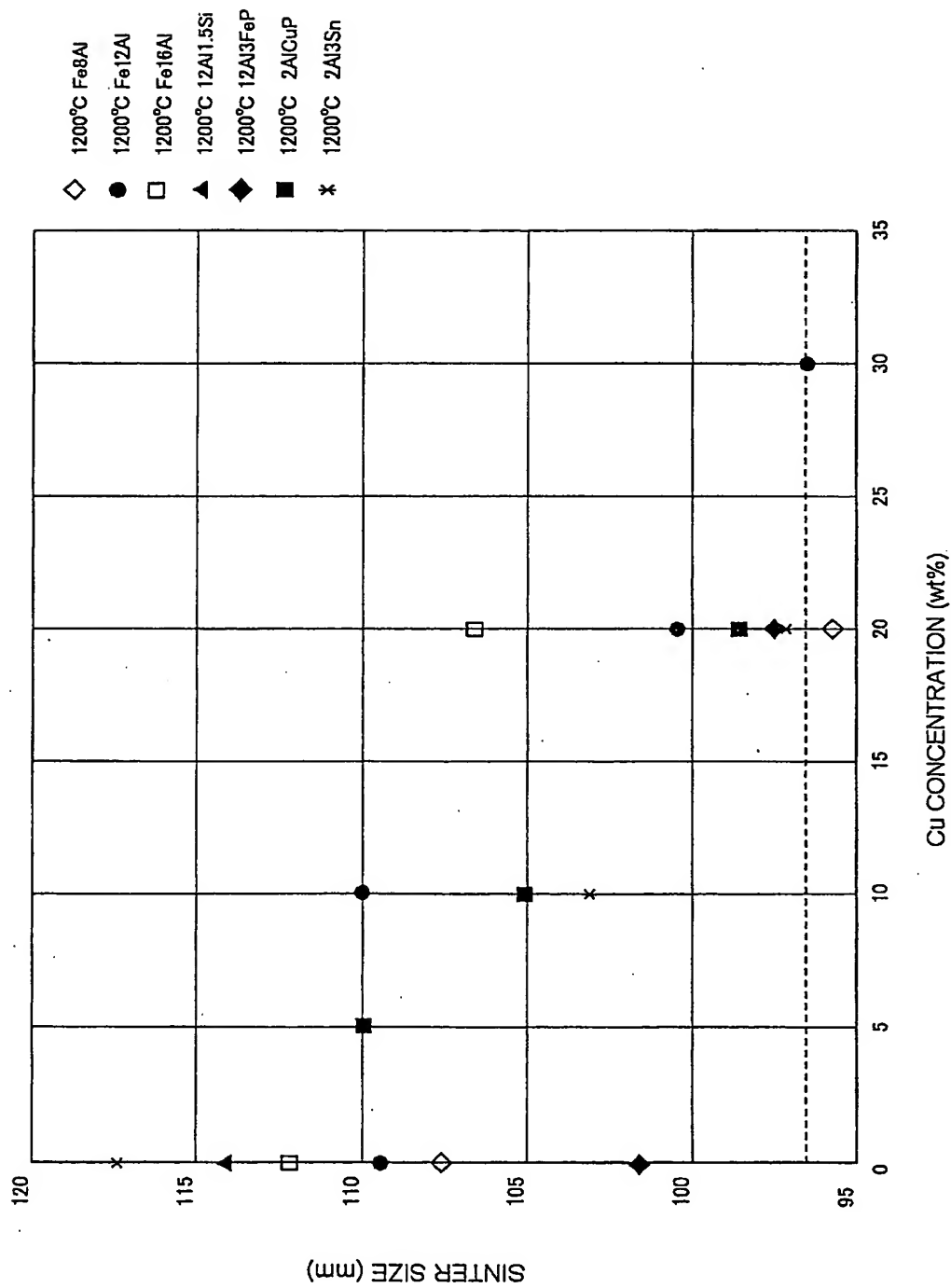


FIG. 13 SINTERING PROPERTIES OF FeAlCu BASE MATERIALS (1250°C)

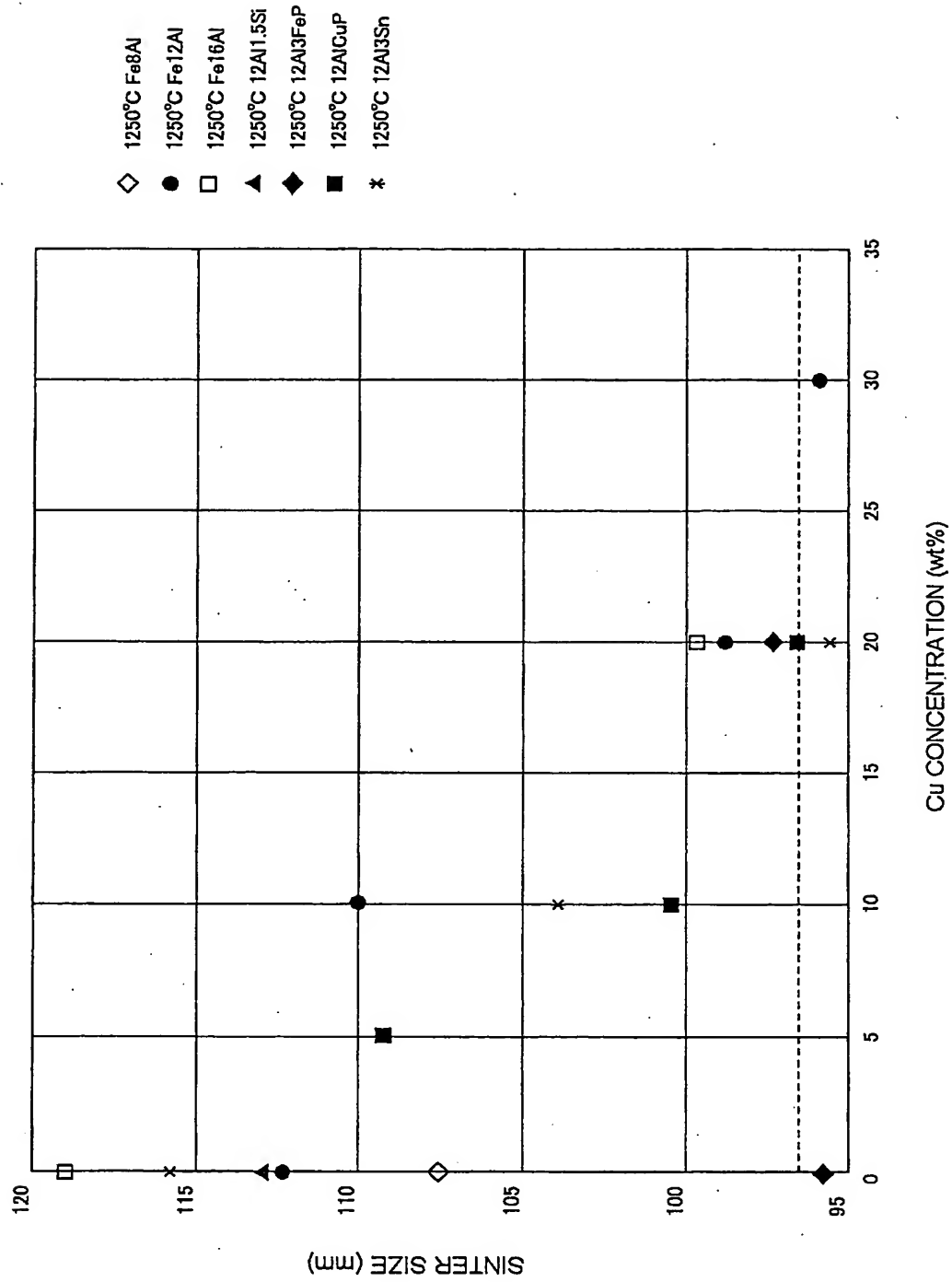
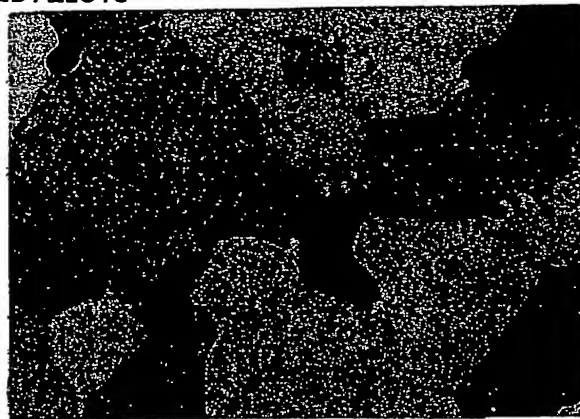


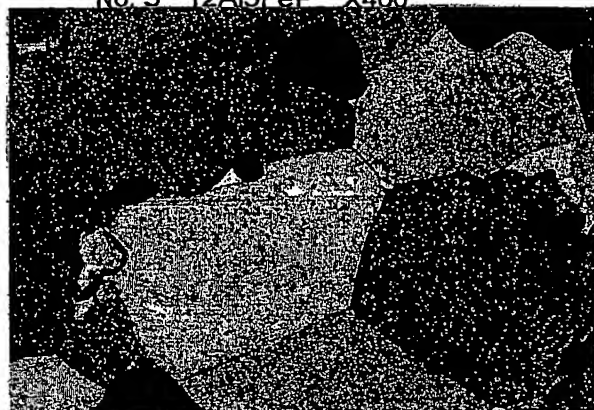
FIG. 14 SINTERED STRUCTURES OF VARIOUS Fe
ORDERED PHASE SINTERED ALLOYS



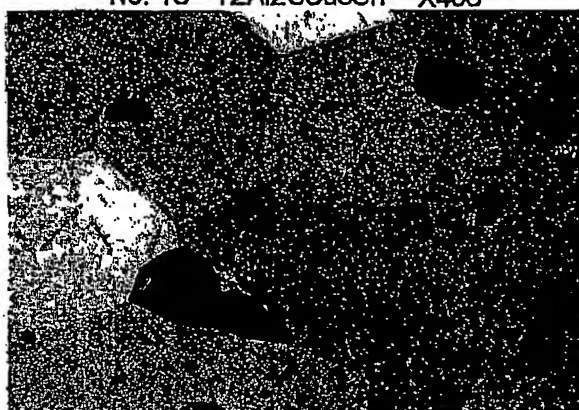
No. 5 12Al3FeP X400



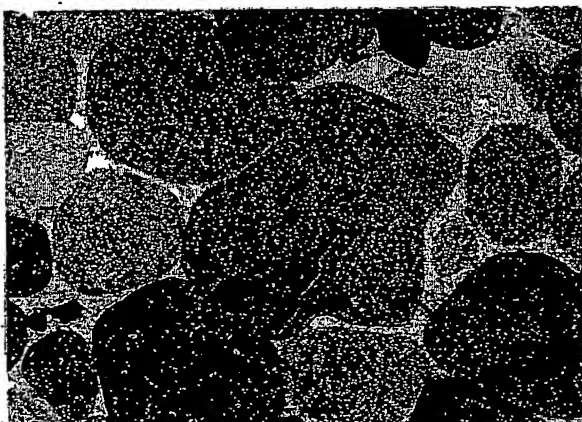
No. 13 12Al20Cu3Sn X400



No. 14 8Al20Cu X400

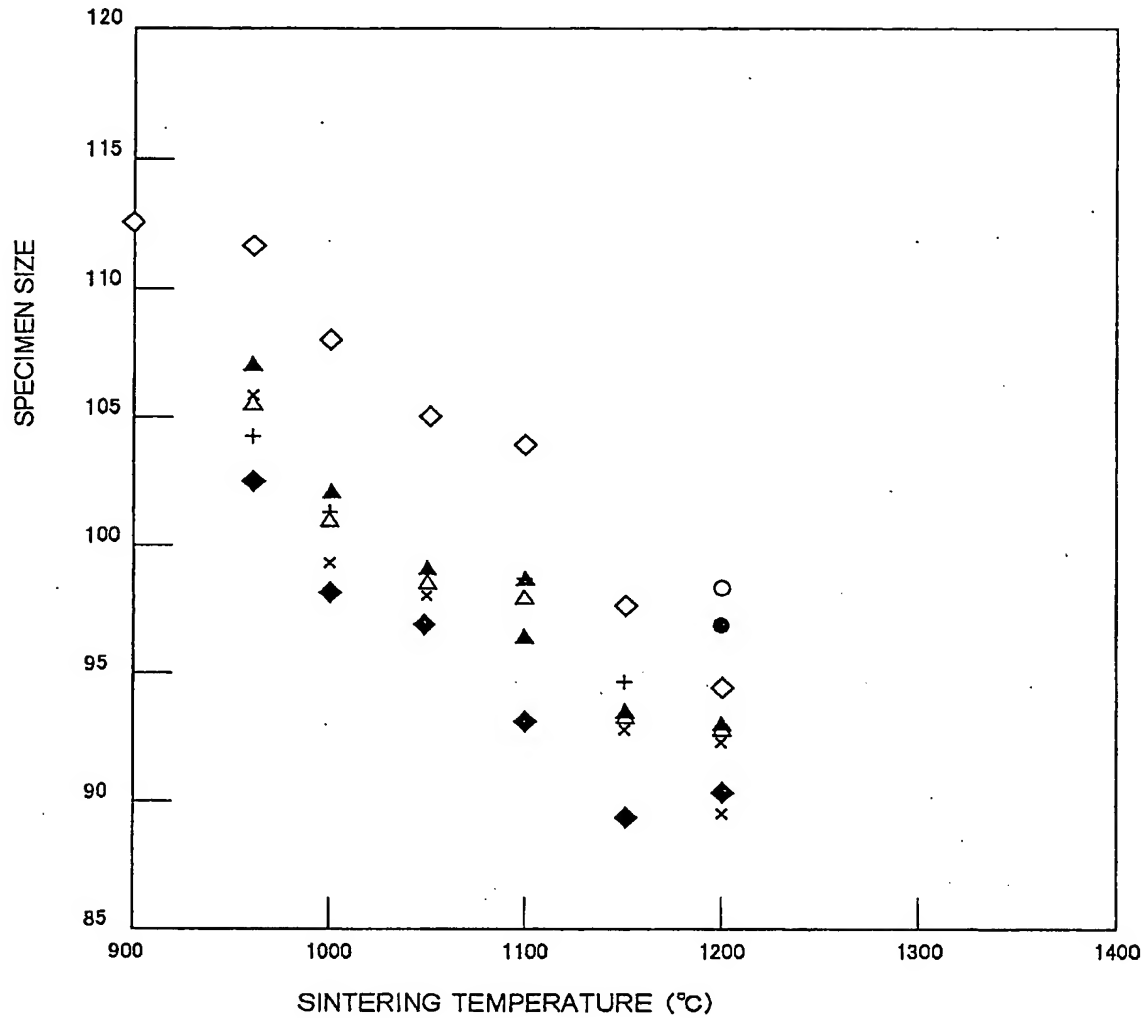


No. 15 16Al20Cu X400



No. 16 12Al30Cu X400

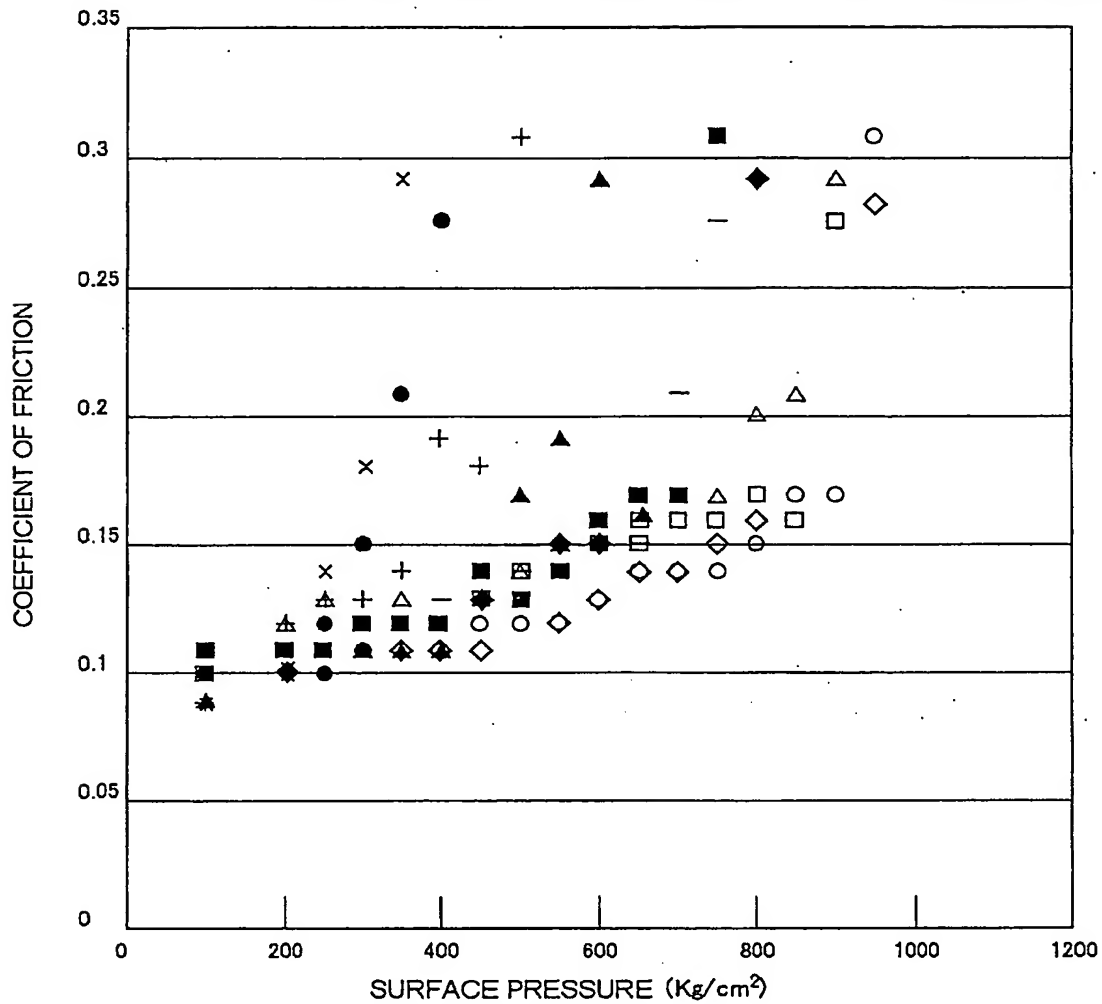
FIG. 15 EFFECTS OF Si, Ni, Co, FeAl ALLOYS UPON SINTER-CONTRACTIBILITY



- ◇ 12Al30Cu1Sn
- + 3Al10Si30Cu2Sn
- x 6Al8Si30Cu2Sn
- △ 10Al3Si30Cu2Sn
- ▲ 10Al5Si30Cu2Sn
- ◆ 6Al-Fe10Al30Cu2Sn
- 12Al30Cu2Sn10Co
- 12Al30Cu2Sn20Co
- 12Al30Cu2Sn10Ni
- 12Al30Cu2Sn20Ni

FIG. 16

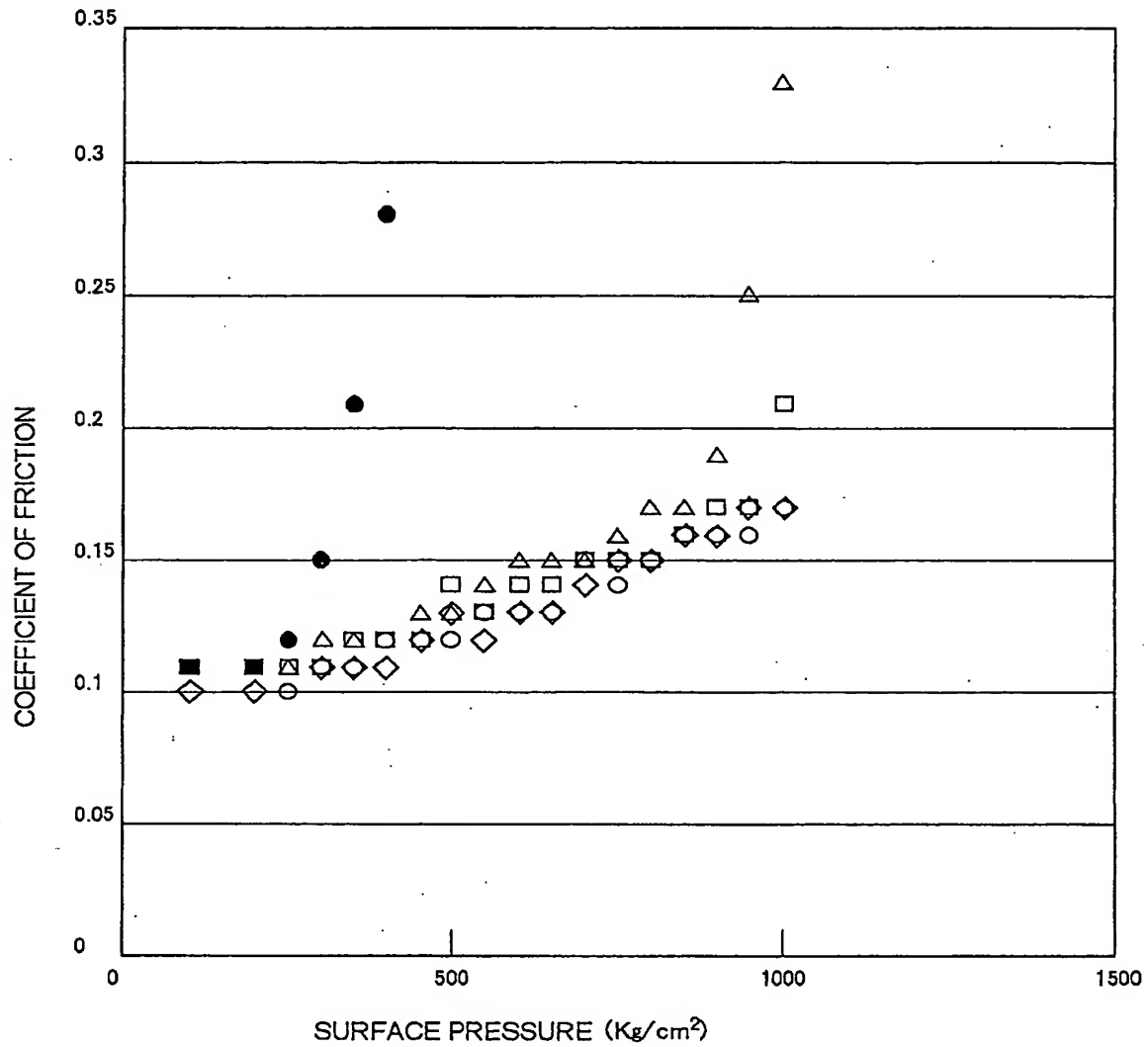
SEIZURE RESISTANCE OF Fe BASE ORDERED
PHASE SINTERED ALLOYS (POROSITY = ABOUT 10% VOLUME)



- HIGH STRENGTH BRASS QUARTERNARY MATERIAL:
COMPARATIVE MATERIAL 3
- △ No5 12Al3FeP
- No20 12Al30Cu
- ◇ No29 12Al30Cu10Co
- No31 12Al30Cu10Ni
- × No43 5FeAl
- + No44 10FeAl
- No45 20FeAl
- No46 30FeAl
- ▲ No47 10FeAlCo
- ◆ No48 20FeAlCo

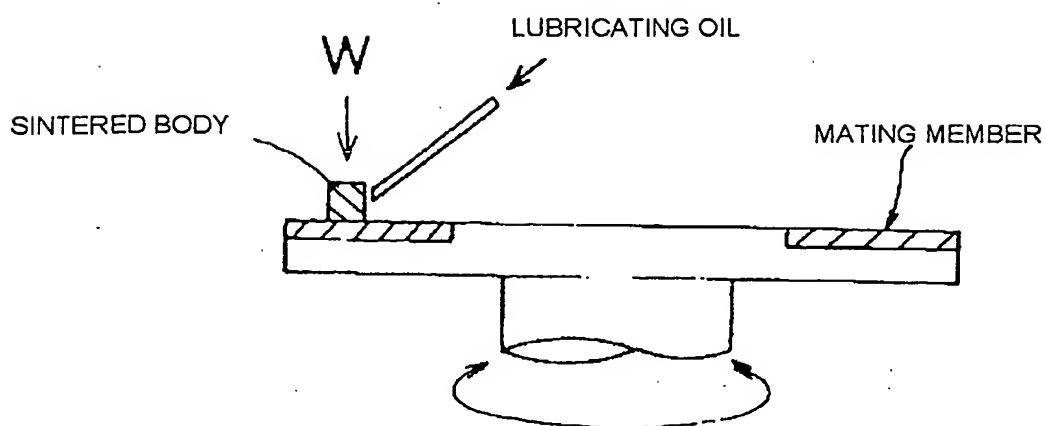
FIG. 17

SEIZURE RESISTANCE OF Fe BASE ORDERED
PHASE SINTERED ALLOYS (POROSITY = ABOUT 20% VOLUME)



- HIGH STRENGTH BRASS QUARTERNARY MATERIAL:
COMPARATIVE MATERIAL 3
- △ No5 12Al3FeP
- No20 12Al30Cu
- ◇ No29 12Al30Cu10Co
- No31 12Al30Cu10Ni

FIG. 18



TEST CONDITIONS

MATING MEMBER: CARBURIZED AND QUENCHED SCM 420

SURFACE HARDNESS: H_{RC} 60~62

SURFACE COARSENESS: 2.55 OR LESS

LUBRICATING OIL: E001, AMOUNT OF OIL: $250\text{cm}^3/\text{min}$.

OIL TEMPERATURE: 60°C

CIRCUMFERENTIAL SPEED: 10m/sec .

SURFACE PRESSURE: $\text{max } 800\text{kg/cm}^2$

(50kg/cm^2 for each time)

FIG. 19

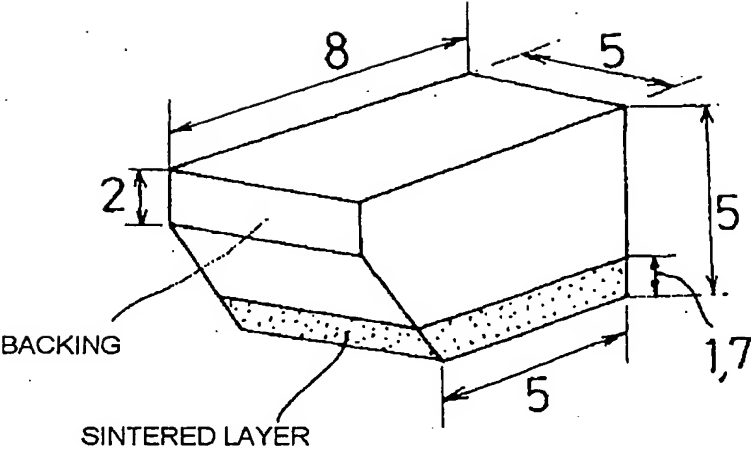
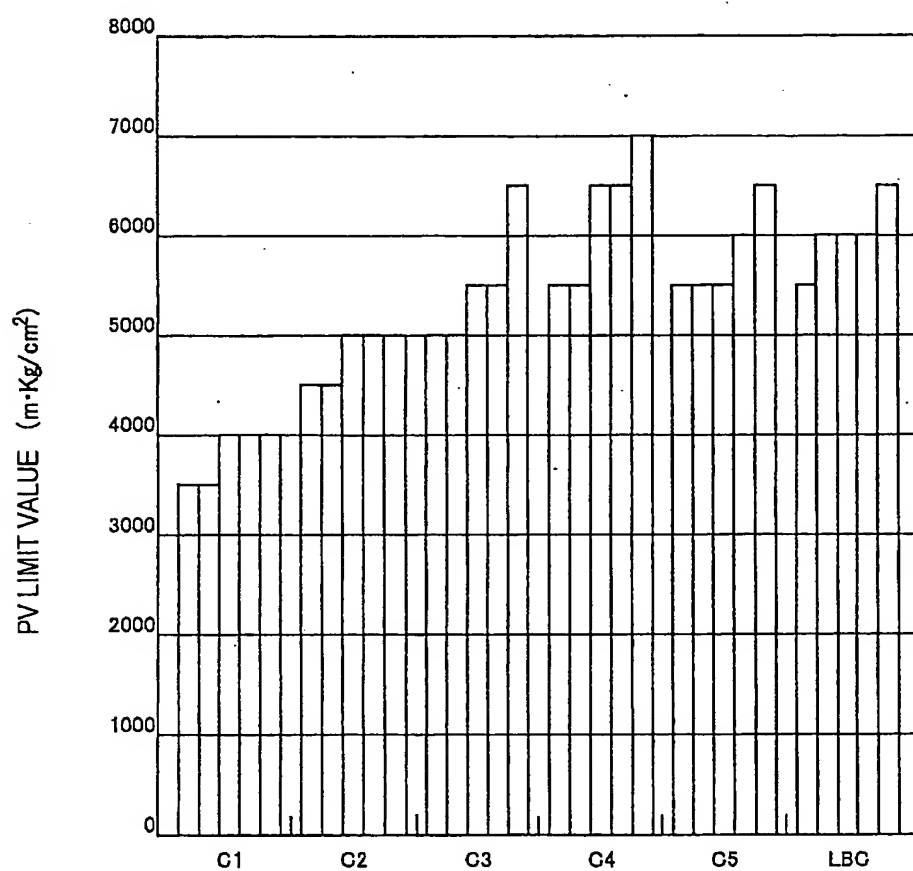


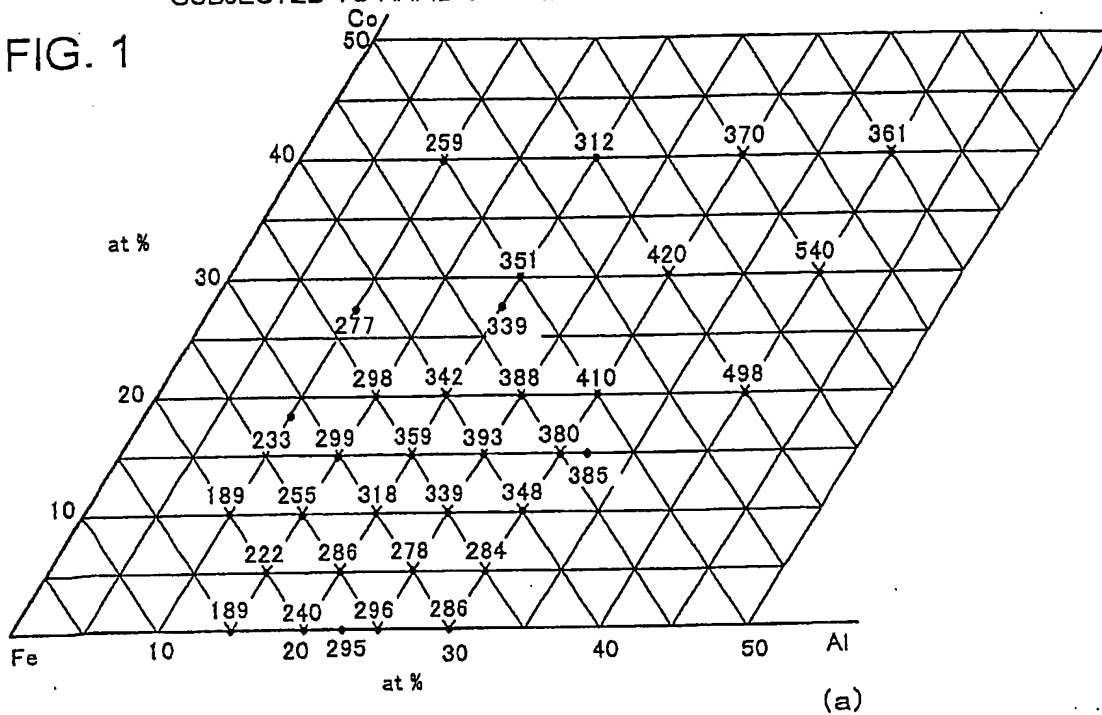
FIG. 20

SLIDING PROPERTIES OF Fe BASE SINTERED MATERIALS



HARDNESS DISTRIBUTION WHEN Fe-Al-Co TERNARY ALLOYS ARE
SUBJECTED TO RAPID COOLING AFTER HEATING AT 1,200 °C

FIG. 1



HARDNESS DISTRIBUTION WHEN 10-HOUR AGING IS DONE AT 600 °C

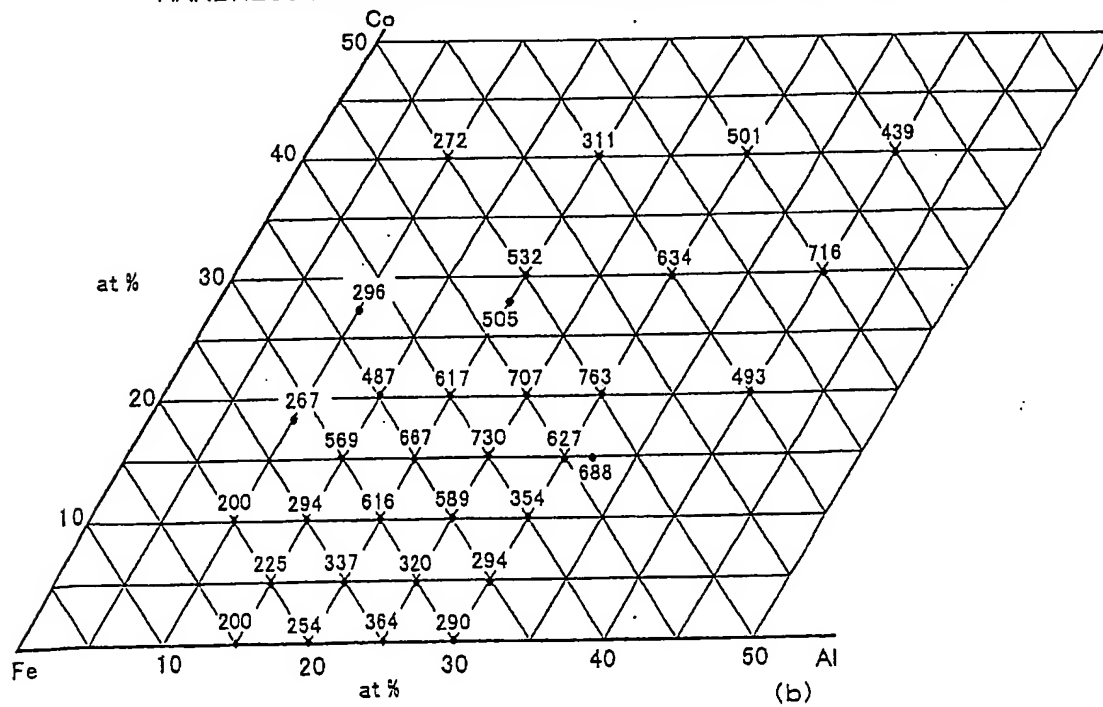


FIG. 2

EFFECT OF ADDITION OF Co UPON HARDNESS OF Fe-Al ALLOYS

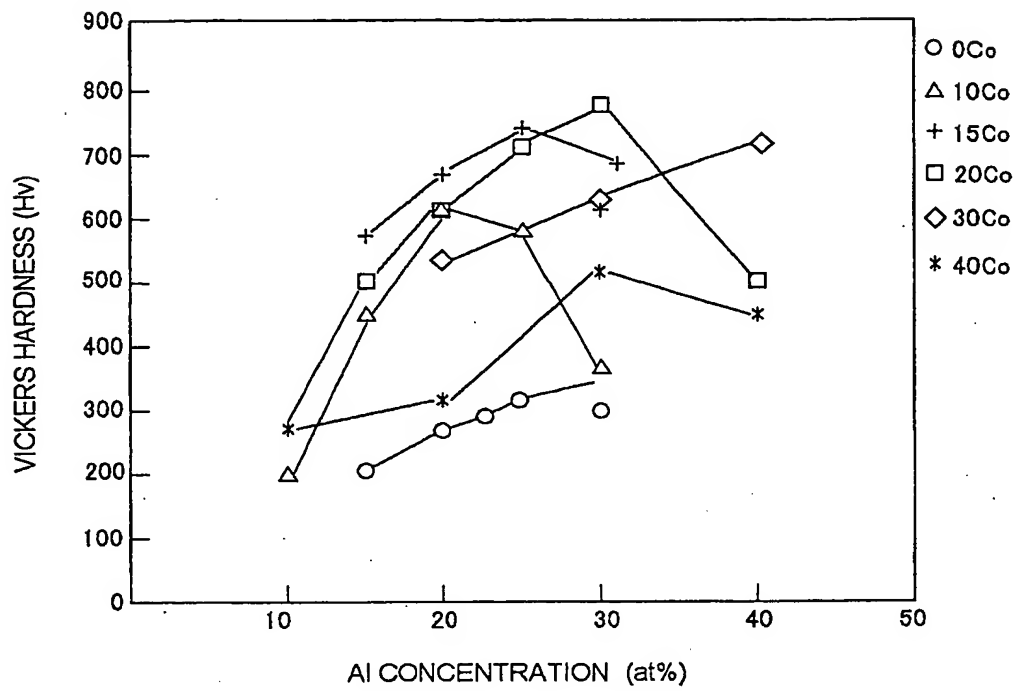


FIG. 3

CURIE TEMPERATURE OF Fe-Al-10AT% Co ALLOYS

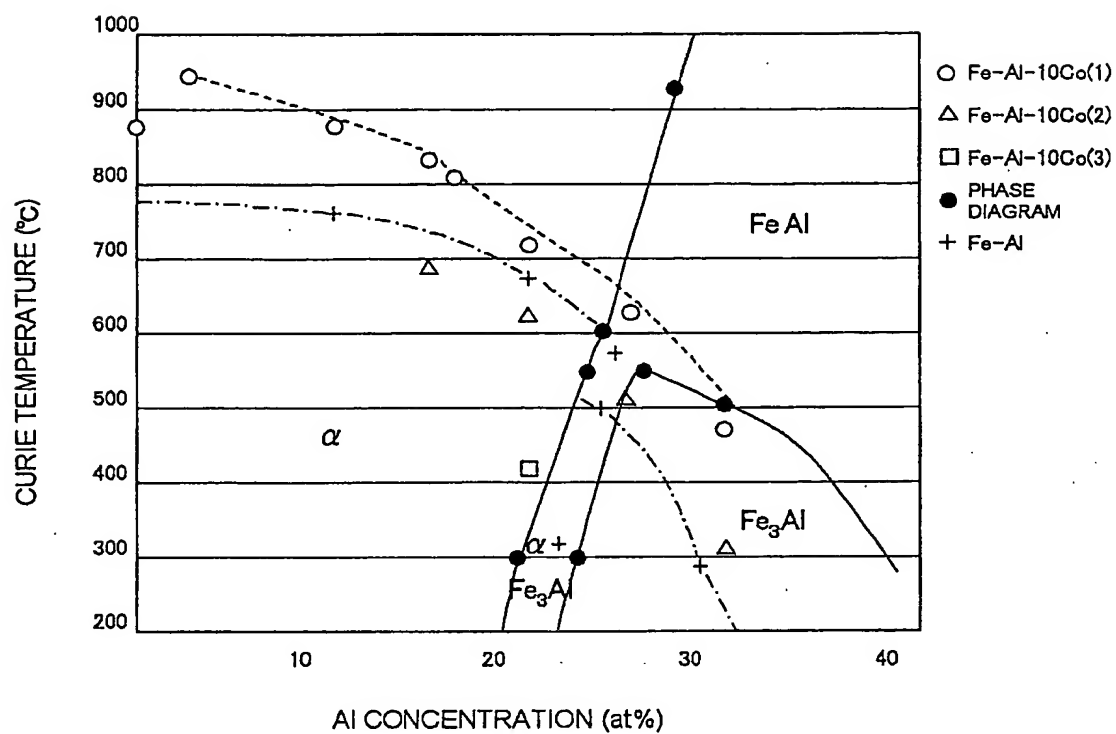
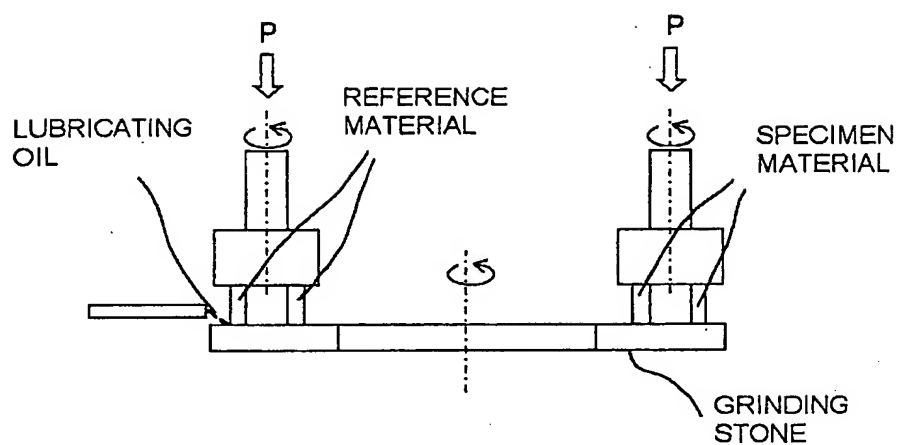


FIG. 4



LOAD: 100kg
ROTATIONAL SPEED OF GRINDING STONE: 60rpm
ROTATIONAL SPEED OF SPECIMEN: 10rpm
LUBRICATING OIL: #30 OIL
AMOUNT OF LUBRICATING OIL: 5cc/min
REFERENCE MATERIAL: S45C QUENCHED AND
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(Hv=500)

FIG. 5 HARDNESS OF Fe BASE ORDERED PHASE MATERIALS VERSUS THEIR ABRASION RATIOS

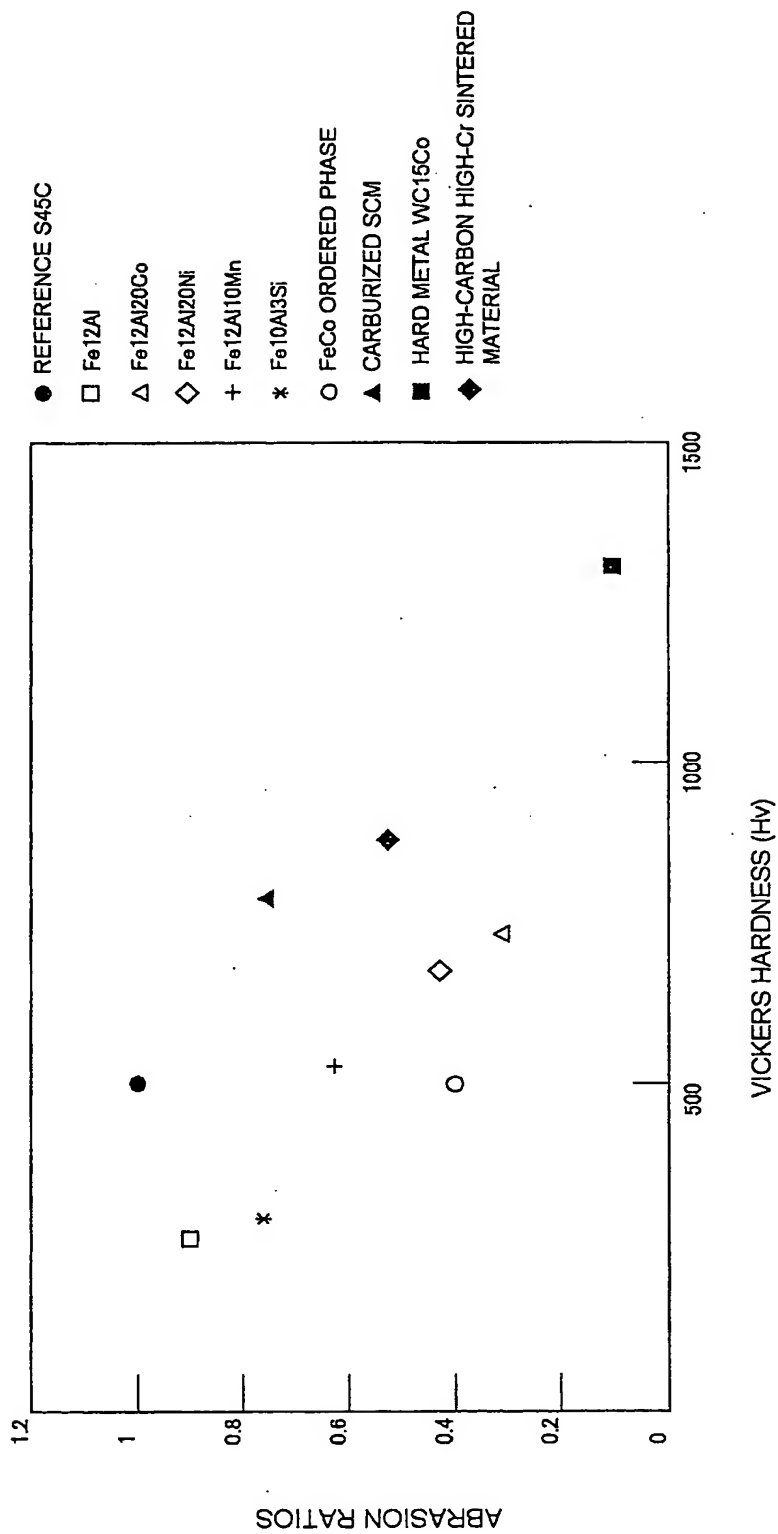


FIG. 6

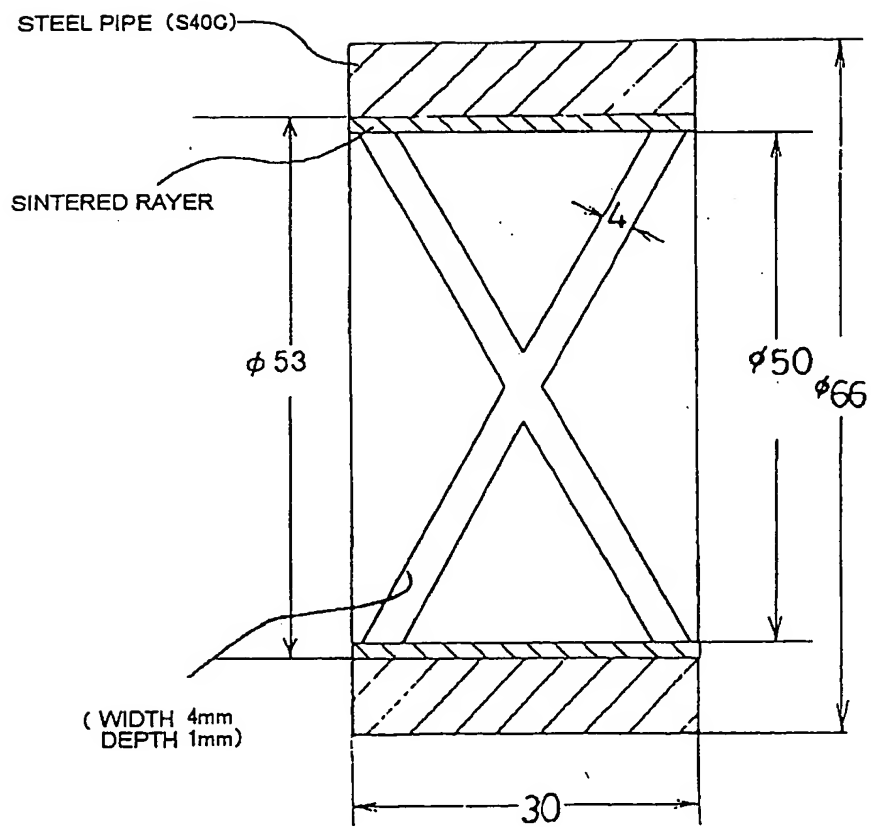


FIG. 7

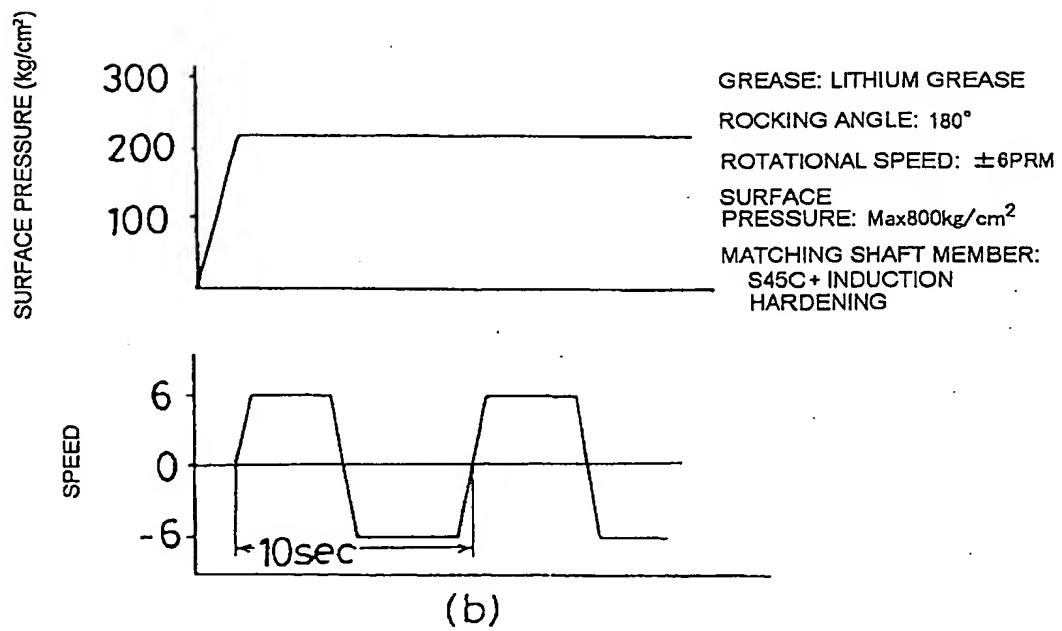
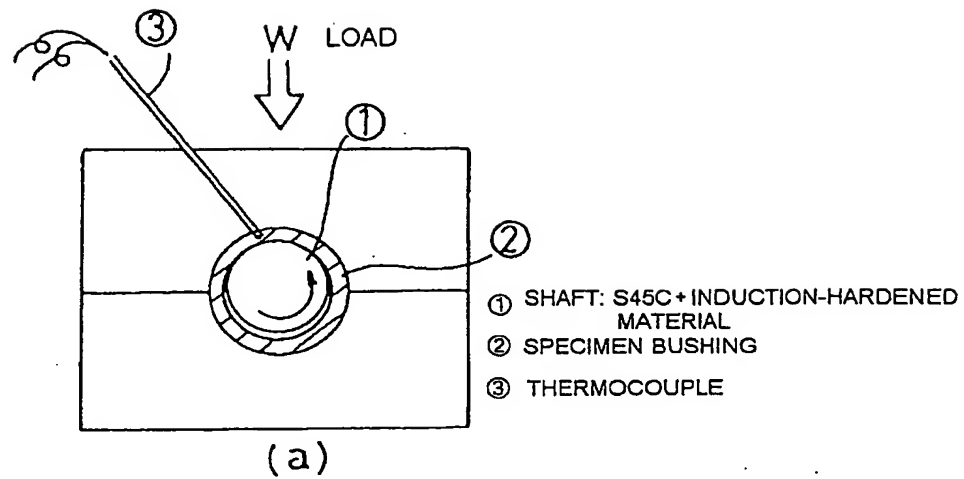


FIG. 8

COEFFICIENTS OF SLIDING CONTACT FRICTION
OF Fe BASE ORDERED PHASE MATERIALS

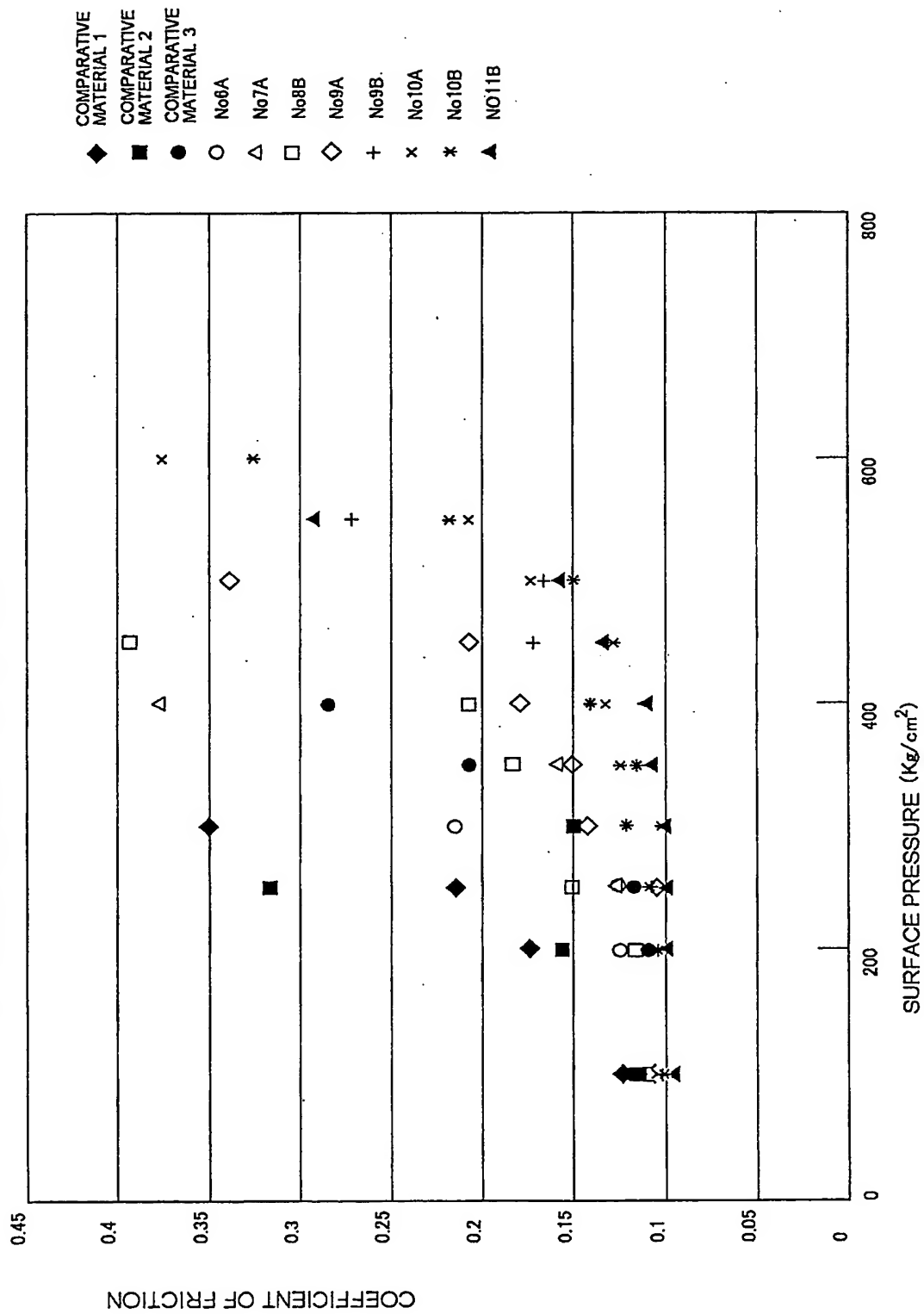


FIG. 9
SLIDING ABRASION AMOUNTS OF Fe BASE
ORDERED PHASE MATERIALS

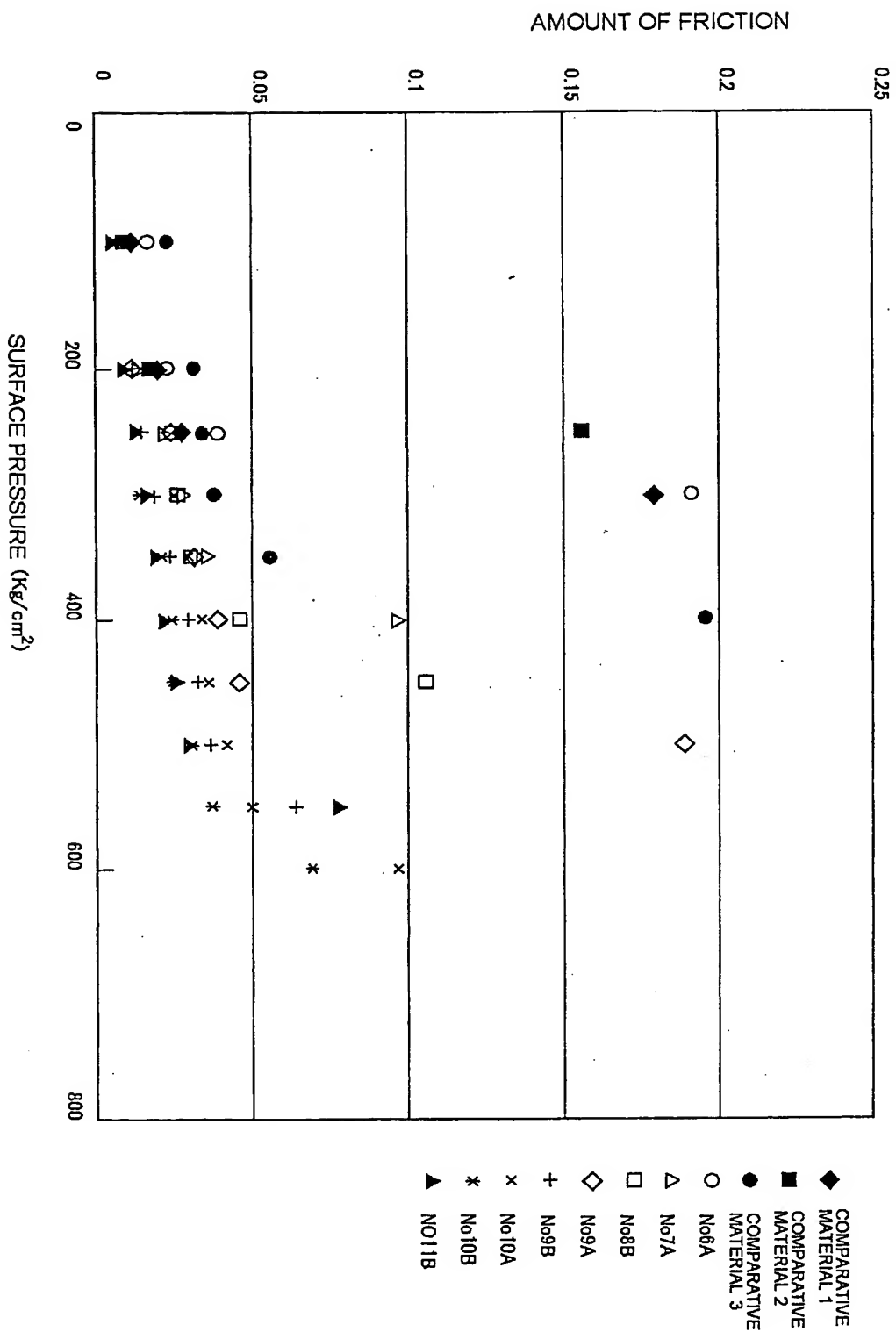


FIG. 10

(UNIT :mm)

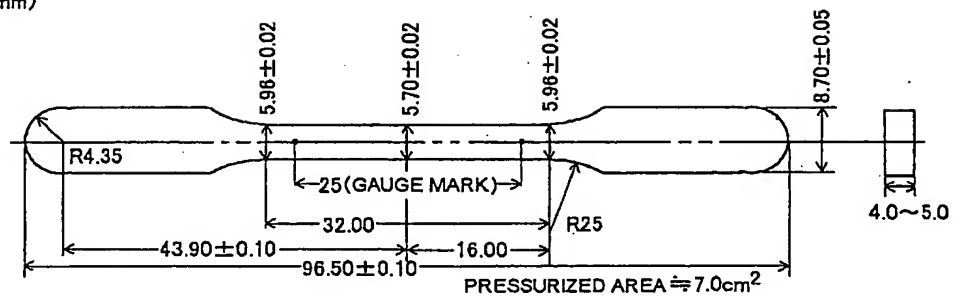


FIG. 11

SINTERING PROPERTIES OF FeAlCu BASE MATERIALS (1140°C)

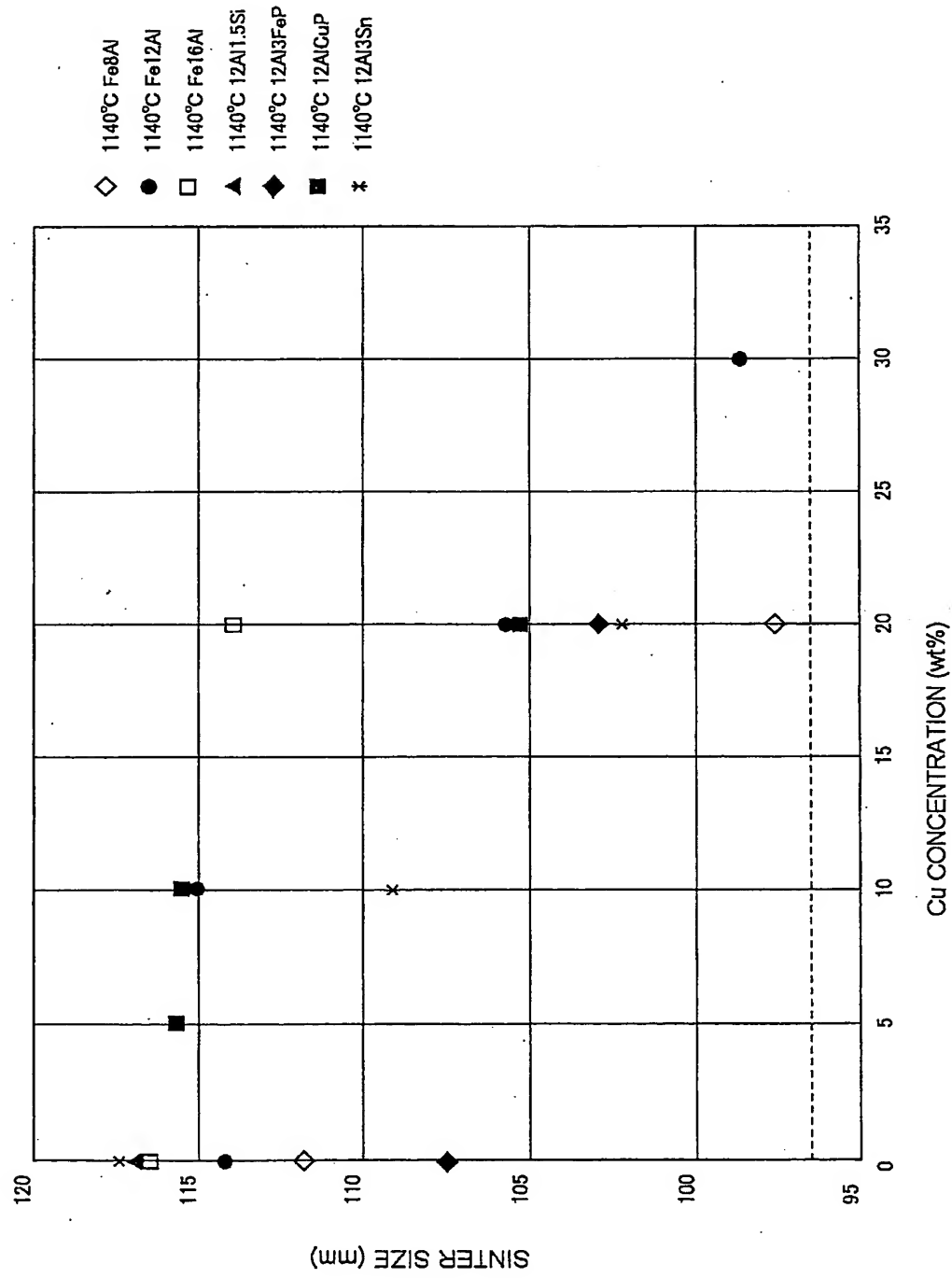


FIG. 12 SINTERING PROPERTIES OF FeAlCu BASE MATERIALS (1200°C)

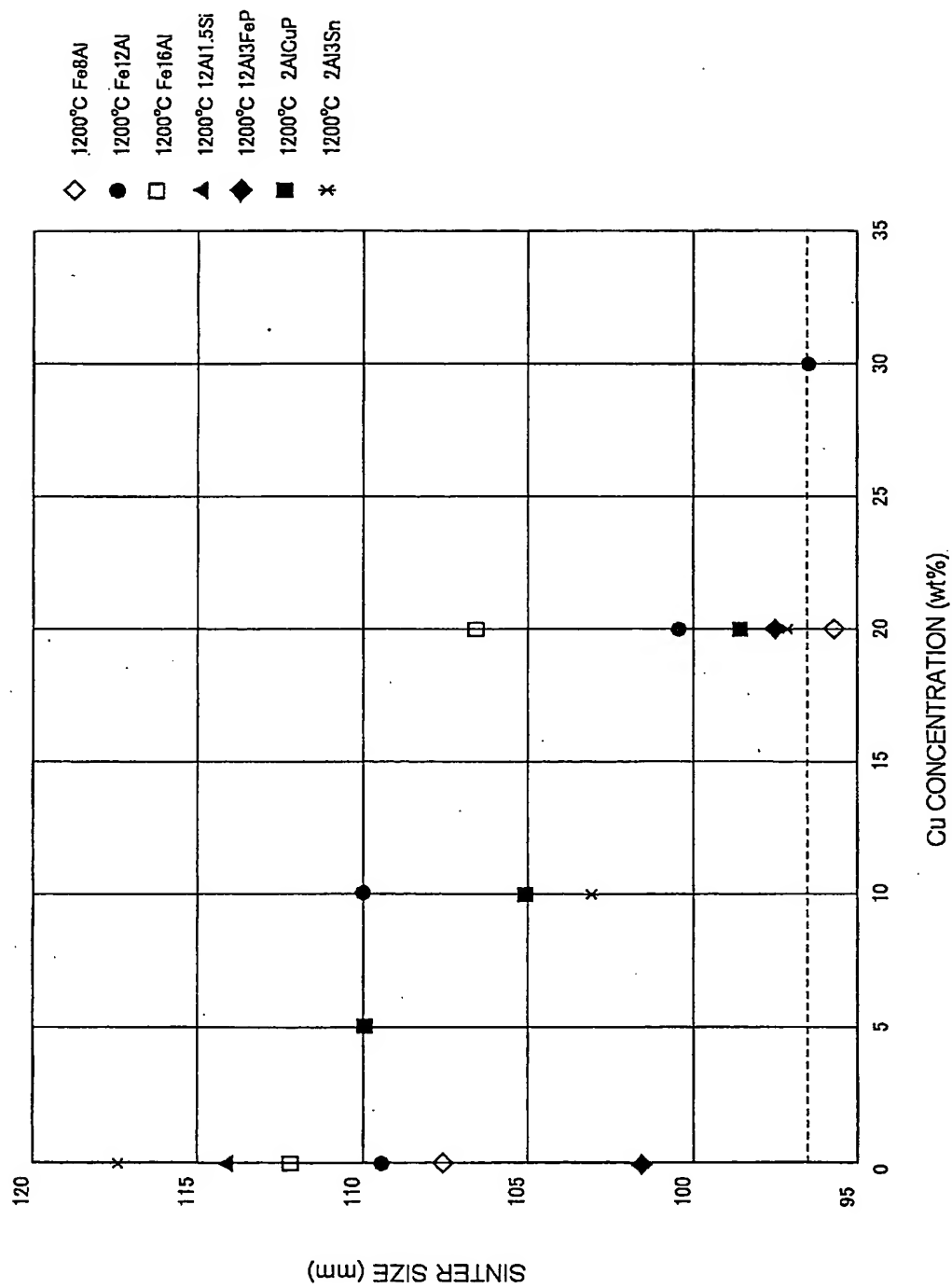


FIG. 13 SINTERING PROPERTIES OF FeAlCu BASE MATERIALS (1250°C)

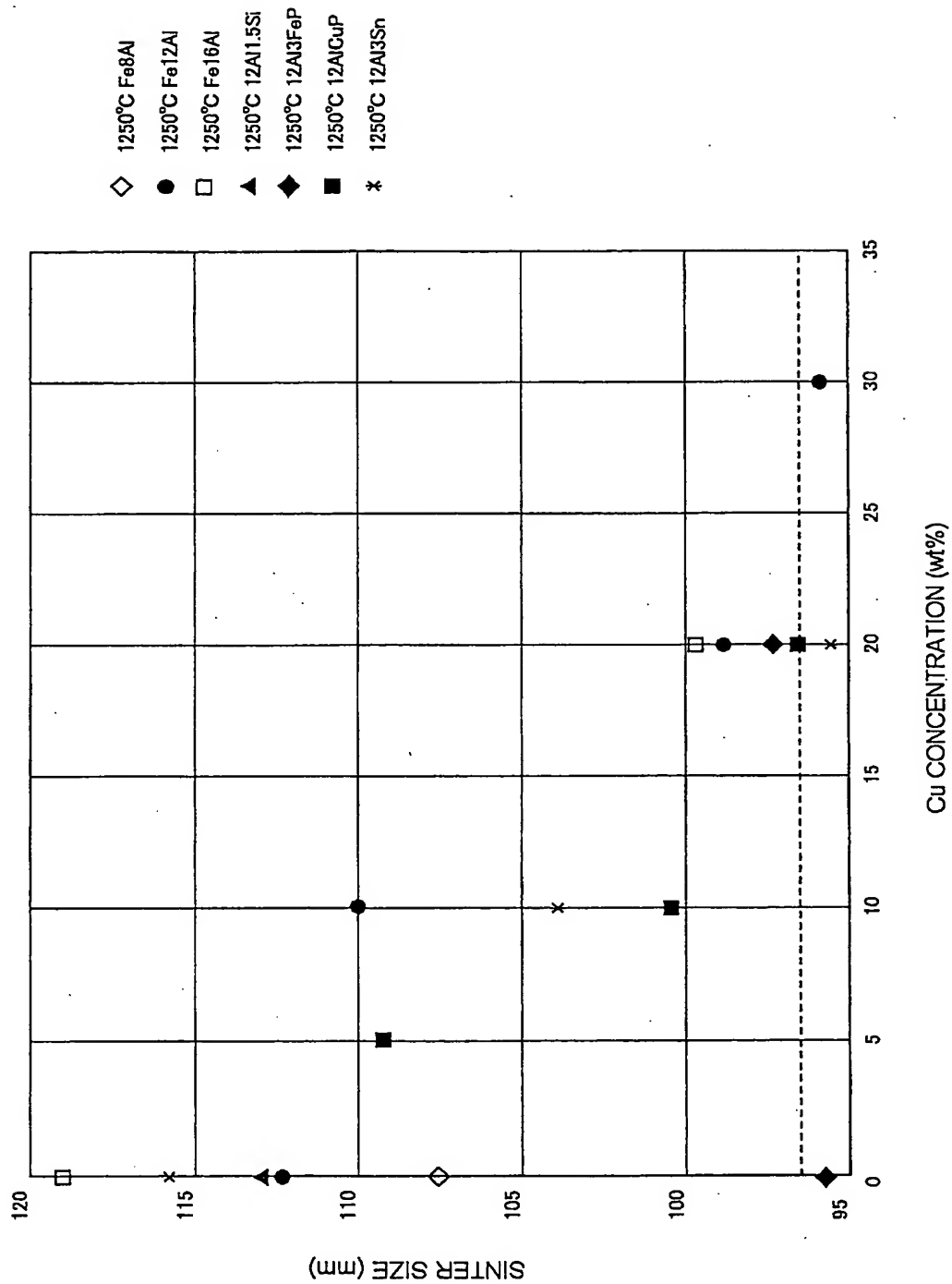
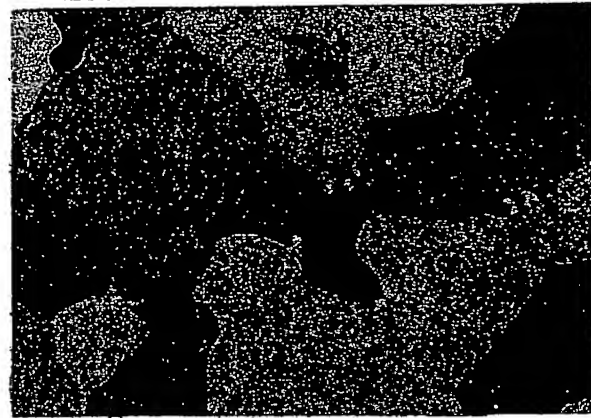


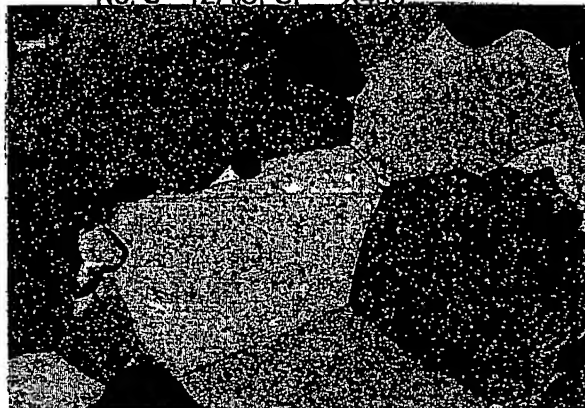
FIG. 14 SINTERED STRUCTURES OF VARIOUS Fe
ORDERED PHASE SINTERED ALLOYS



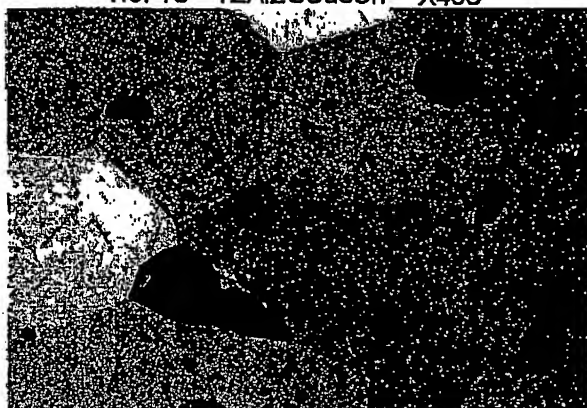
No. 5 12Al3FeP X400



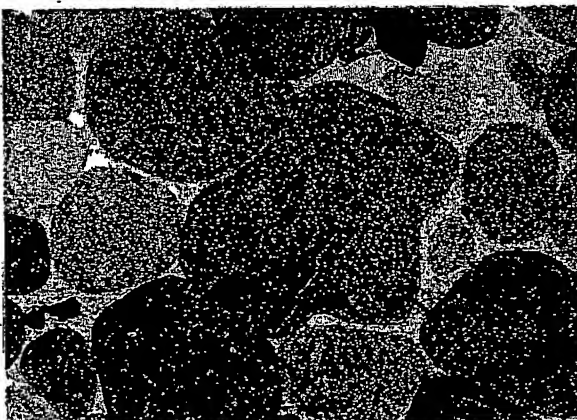
No. 13 12Al20Cu3Sn X400



No. 14 8Al20Cu X400

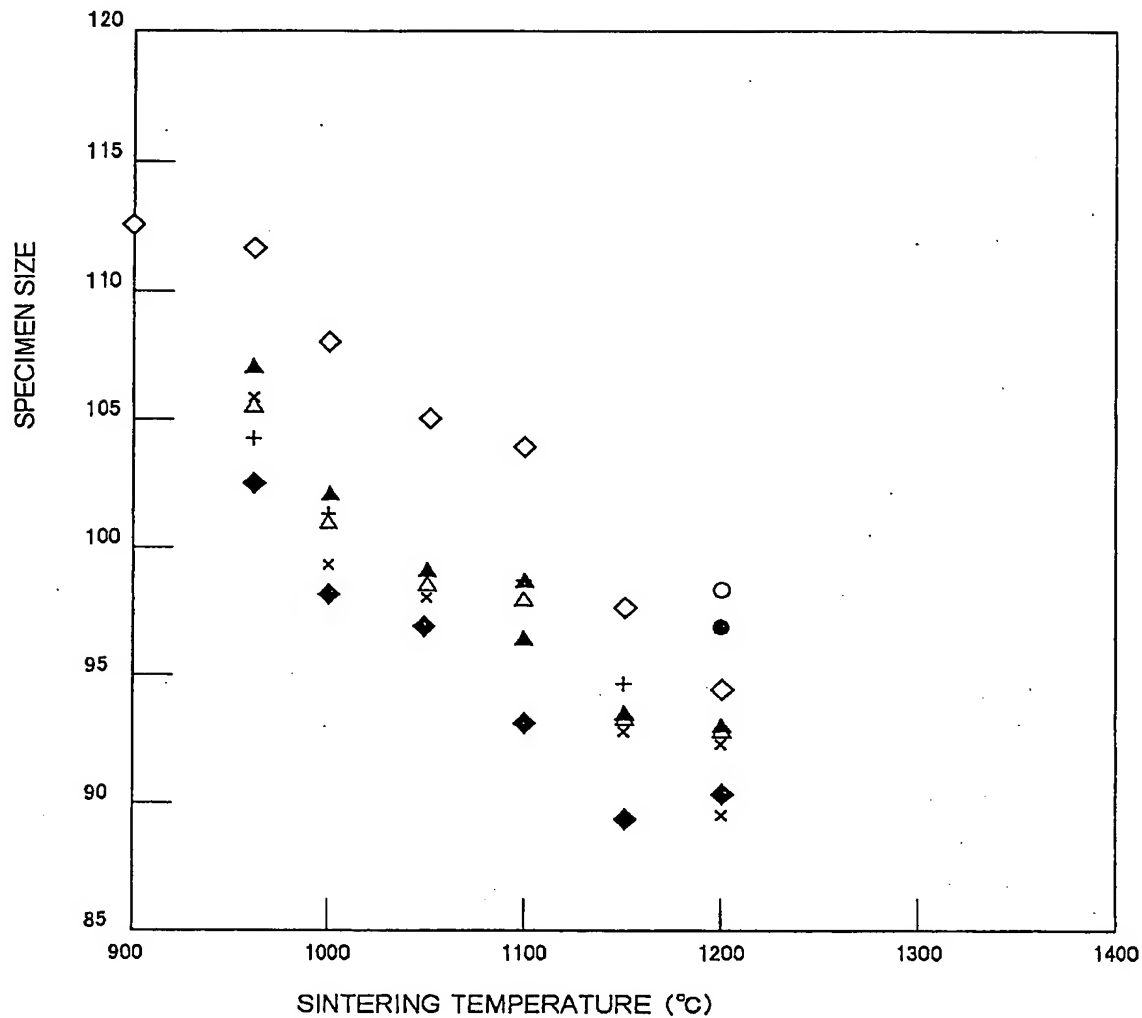


No. 15 16Al20Cu X400



No. 16 12Al30Cu X400

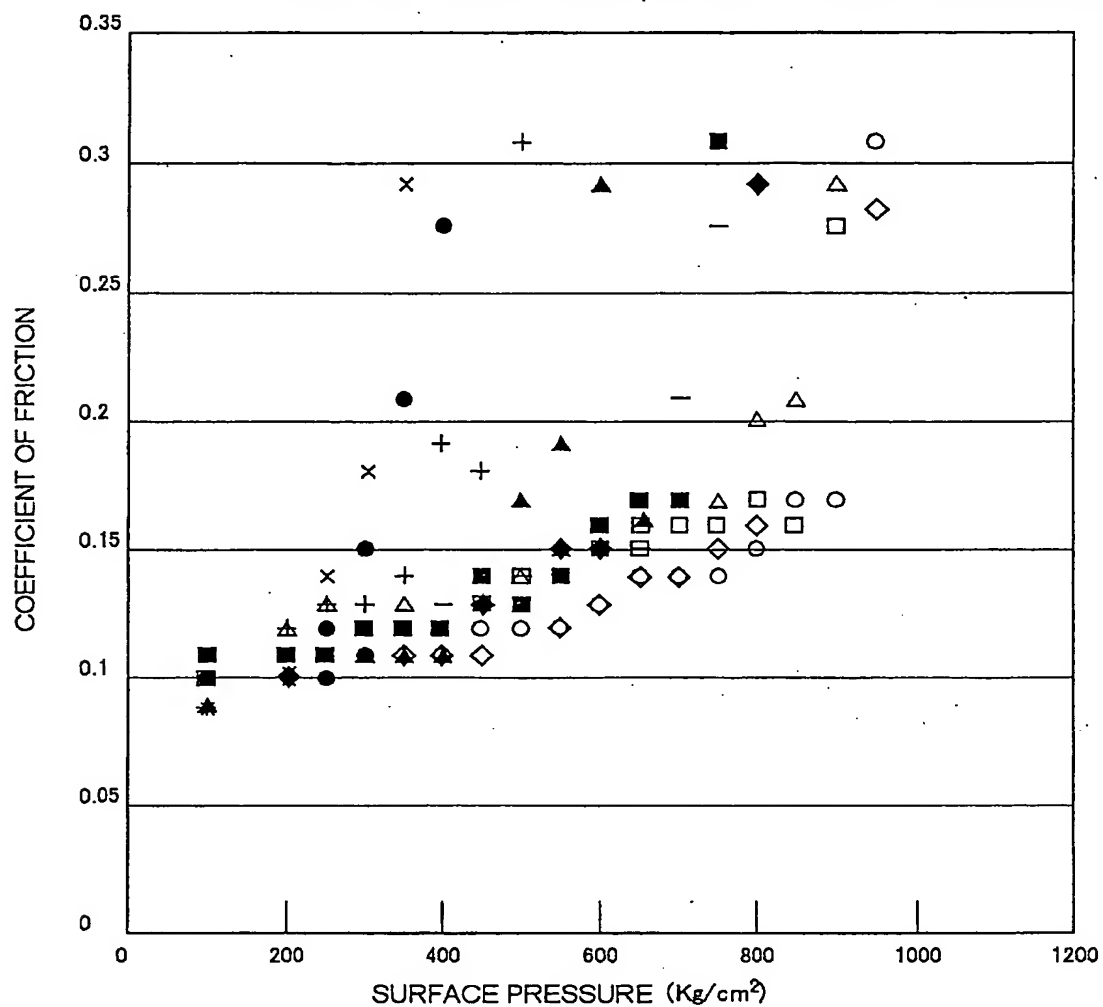
FIG. 15 EFFECTS OF Si, Ni, Co, FeAl ALLOYS UPON SINTER-CONTRACTIBILITY



- ◇ 12Al30Cu1Sn
- + 3Al10Si30Cu2Sn
- x 6Al8Si30Cu2Sn
- △ 10Al3Si30Cu2Sn
- ▲ 10Al5Si30Cu2Sn
- ◆ 6Al·Fe10Al30Cu2Sn
- 12Al30Cu2Sn10Co
- 12Al30Cu2Sn20Co
- 12Al30Cu2Sn10Ni
- 12Al30Cu2Sn20Ni

FIG. 16

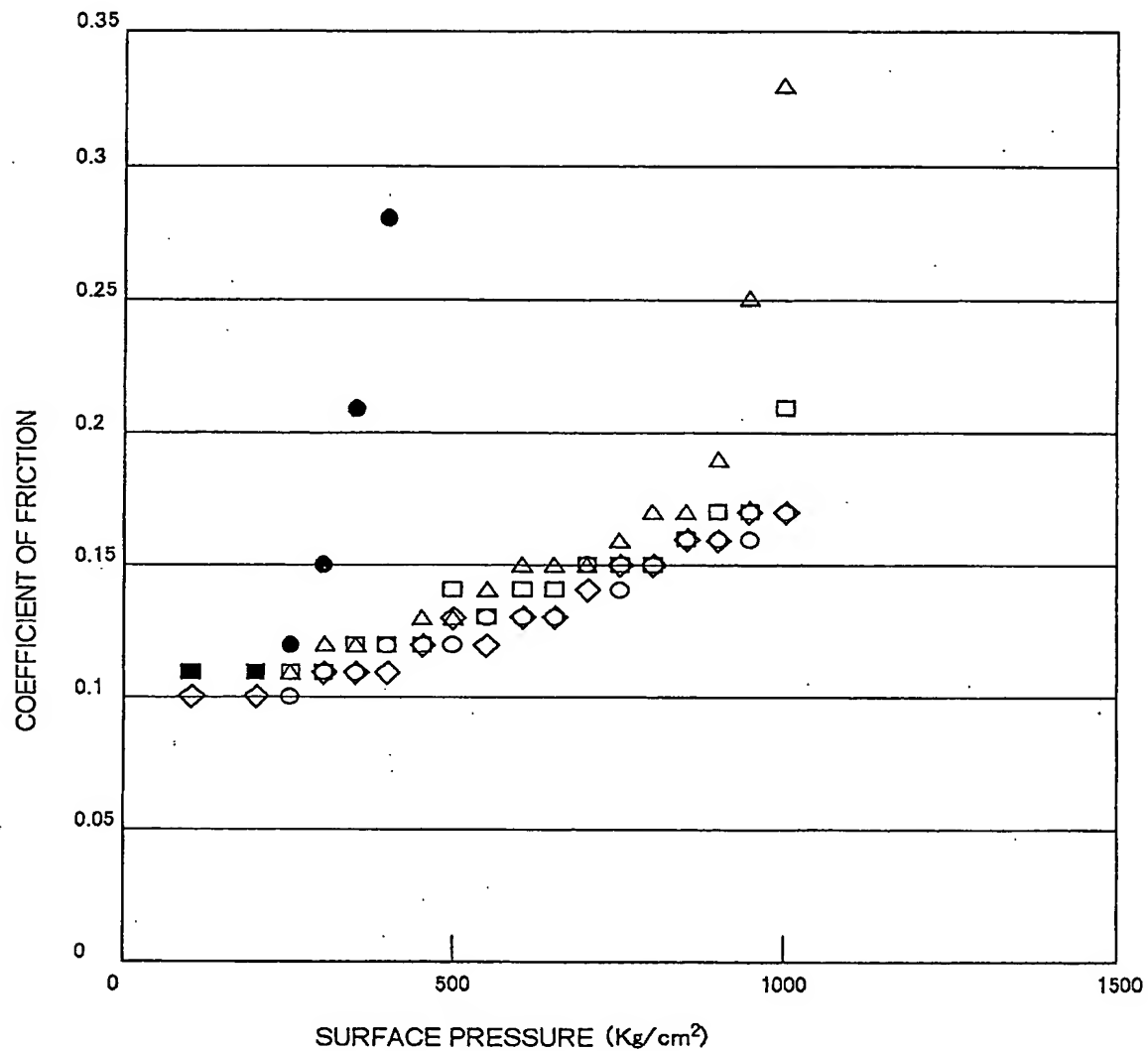
SEIZURE RESISTANCE OF Fe BASE ORDERED
PHASE SINTERED ALLOYS (POROSITY = ABOUT 10% VOLUME)



- HIGH STRENGTH BRASS QUATERNARY MATERIAL:
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- No20 12Al30Cu
- ◇ No29 12Al30Cu10Co
- No31 12Al30Cu10Ni
- × No43 5FeAl
- + No44 10FeAl
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- No46 30FeAl
- ▲ No47 10FeAlCo
- ◆ No48 20FeAlCo

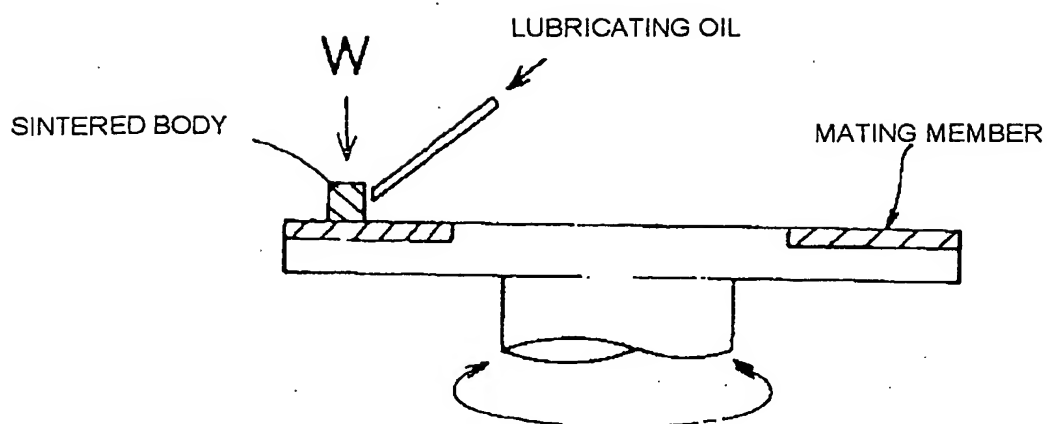
FIG. 17

SEIZURE RESISTANCE OF Fe BASE ORDERED
PHASE SINTERED ALLOYS (POROSITY = ABOUT 20% VOLUME)



- HIGH STRENGTH BRASS QUARTERNARY MATERIAL:
COMPARATIVE MATERIAL 3
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- No20 12Al30Cu
- ◇ No29 12Al30Cu10Co
- No31 12Al30Cu10Ni

FIG. 18



TEST CONDITIONS

MATING MEMBER: CARBURIZED AND QUENCHED SCM 420

SURFACE HARDNESS: H_{RC} 60 ~ 62

SURFACE COARSENESS: 2.55 OR LESS

LUBRICATING OIL: E001, AMOUNT OF OIL: $250\text{cm}^3/\text{min}$.

OIL TEMPERATURE: 60°C

CIRCUMFERENTIAL SPEED: 10m/sec .

SURFACE PRESSURE: $\text{max } 800\text{kg/cm}^2$

(50kg/cm^2 for each time)

FIG. 19

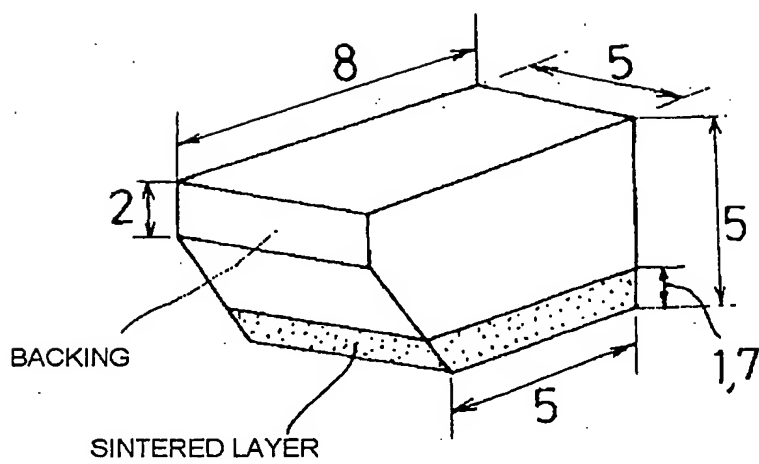


FIG. 20

SLIDING PROPERTIES OF Fe BASE SINTERED MATERIALS

